DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

OPNAVINST 5100.28
N09F
21 Jan 05

OPNAV INSTRUCTION 5100.28

From: Chief of Naval Operations

Subj: HAZARDOUS MATERIAL USER'S GUIDE (HMUG)

Ref: (a) OPNAVINST 5100.19D
(b) OPNAVINST 5090.1B
(c) OPNAVINST 3500.39A

Encl: (1) Hazardous Materials User's Guide

1. Purpose. Enclosure (1) provides Navy afloat personnel with general safety and environmental information for hazardous materials (HM) commonly used on ships.

2. Cancellation. OPNAV P-45-110-03.

3. Scope. The provisions of this instruction are non-mandatory for all Navy ships and are to be applied in conjunction with all environmental, safety, and health precautions required by references (a) through (c) and as a supplement to specific guidance in Material Safety Data Sheets (MSDSs) for any particular HM.

4. Discussion. The HMUG is intended to supplement, not replace, the information contained in MSDSs. The HMUG gives generic risk assessment, compatibility information, control measures, safety precautions, health hazards, spill control, and disposal guidelines for 22 hazardous material groups, arranged by common uses and properties. Using the information contained in this instruction will help reduce the risk of injury and adverse health effects from exposure to hazardous material. Use this instruction to provide HM training to supervisors and the deckplate Sailor on the type of hazardous materials onboard Navy ships. This instruction also applies to operational risk management (ORM) during handling and use of hazardous materials. Under each hazardous material group is a section on "hazard assessment" that contains common key points to consider when

assessing the risks of handling hazardous material. The HMUG does not include items such as ammunition, explosives, propellants, medical or pharmaceutical supplies, and radioactive materials. Nor does it address consumables, such as personal care products (deodorants, shoe polish, hair spray, etc.).

5. Action. The HMUG shall be readily available in every shipboard work center where hazardous materials are handled, used, distributed, or stored. All ships should implement and manage use of the HMUG in conjunction with references (a) through (c) and applicable Material Safety Data Sheets. Fleet Commanders, Type Commanders, Wings, Squadrons, and Commanding Officers may issue more stringent policy and procedures when additional guidance is considered necessary by the chain of command.

6. Forms

Form	Title	Stock number
DD 2522	Hazardous Chemical Warning Label	0108-LF-981-3800
DD 1348-1A	Issue Release/Receipt Document	0102-FL-115-3800
DD 1532-1	Pest Management Maintenance Record	

7. Report. Symbol DD-A&T (A&AR)1080 has been assigned to the reporting requirement contained in Group 22, and approved for reports control by SECNAVINST 5214.2B.

R. E. BROOKS
Special Assistant for Safety

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FT111 (Occupational Safety and Health and Environmental Training Center)
41A (Commander MSC)
CNO (N09F, N45, N76, N77, N78)

OPNAVINST 5100.28
21 Jan 05

HAZARDOUS MATERIAL USER'S GUIDE

December 2004

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
PREFACE

The Hazardous Material User's Guide (HMUG) has been published to ensure the fleet is provided easily understandable safety and health information to **supplement, but not replace, the technical data found in material safety data sheets (MSDSs).** The information in this guide is designed to assist HM users in protecting themselves and the environment. It is a source document for general HM training. The contents of this HMUG include compatibility information, control measures, precautions, health hazards, spill control guidance, and disposal guidelines for 22 HM groups. It also provides a personal protective equipment (PPE) shopping guide.

The HMUG contains information gathered from the best sources available within and outside the U.S. Navy. It is intended to be readily available and used in every work center. Applicable sections can be copied and posted in areas where specific HM groups are frequently handled, used or stored.

This HMUG is a product of the Naval Safety Center working closely with the Naval Sea Systems Command, the Naval Supply Systems Command, the Navy Occupational Safety and Health and Environmental Training Center, and the Navy Environmental Health Center.

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INTRODUCTION

The HMUG was developed to provide Navy personnel, particularly the deck plate sailor, with general safety information for HM commonly used on ships. **The User's Guide is intended to supplement, not replace, the information contained in Material Safety Data Sheets (MSDSs).** Always refer to the material's MSDS first. The User's Guide can then be used to clarify and provide additional information on the material.

The HMUG gives generic risk assessment, compatibility information, control measures, safety precautions, health hazards, spill control, and disposal guidelines for 22 HM groups (for instance, adhesives, acids, greases, paints, and solvents). HM are grouped by common uses and properties.

If a specific health hazard assessment is needed, BUMEDINST 6270.8A provides guidance on how to request a health hazard assessment for the material being used. Any requests for a health hazard assessment performed by the Navy Environmental Health Center should be submitted through the originator's chain of command for review/endorsement prior to submittal.

- The Risk Assessment section lists things that should be considered when assessing the risk or conducting Operational Risk Management (ORM) for handling this type of material.

- The Compatibility Information section lists examples of material classes that are generally not compatible with the specified HM group.

- The Control Measures identify and prescribe general personal protective equipment (PPE) that is appropriate for the chemical hazards in the group. PPE should always be chosen based on the specific materials being used, the operation or process being performed, and the exposure assessment results. The Safety Officer, Respiratory Protection Manager and Medical Department Representative will have access to the detailed Industrial Hygiene Survey to aid them in selecting the correct protective equipment.

- The Safety Precautions section gives safety guidance for using and storing the HM in the group.

- The Health Hazards section points out common symptoms and effects of exposure to the HM in the group and provides "What to do" instructions for the HM user.

- The Spill Control section provides information for responding to a spill.

- The Disposal Guidelines section gives acceptable methods for disposing of materials within the group.

The User's Guide does not include items such as ammunition, explosives, propellants, medical or pharmaceutical supplies, and radioactive materials. It also does not address consumables, such as personal care products (deodorants, shoe polish, hair spray, etc.).

When working with HM, use the information in this guide **as a supplement to specific guidance in the Material Safety Data Sheet (MSDS)**. The information given here is generic for a type of material – it will not provide the details about the chemical composition, specific toxic components or special considerations.

Every ship and shore activity is required to have an Industrial Hygiene (IH) Baseline Survey. This IH Survey evaluates every work process and the work environment, may sample the air for contaminants, and recommend certain protective equipment, such as respirators. The Safety Officer, Respiratory Protection Manager (RPM), and Medical Department Representative have access to this information. They will use that information to provide guidance to users of HM concerning the correct respirator, skin protection, and ventilation requirements.

When responding to emergencies, such as HM spills, the Safety Officer, Damage Control Assistant, and Fire Marshall will provide guidance consistent with damage control principles.
Using this information will help reduce the risk of injury and adverse health effects. Use this Guide to provide HM training on the type of HM used by you or those you supervise. Most mishaps that occur involving HM are the result of human error – mislabeled materials, failure to wear proper PPE, or using the material for the wrong purpose.

Many Mishap Reports involving HM indicate that the majority of the victims had failed to follow information similar to that given in this guide and the applicable MSDS, particularly regarding personal protective equipment.

Use the HMUG to protect yourself and your shipmates.

KNOW WHAT MATERIAL YOU ARE WORKING WITH
– READ THE LABEL
AND CONSULT
THE MATERIAL SAFETY DATA SHEET!

HOW TO USE THE HMUG

1. Find the hazardous material (HM) Group that includes the material or materials you will be working with, by doing one of the following:

- Check Appendix B and find the common name of the material from the container's label. This is cross-referenced to the Standard Planned Maintenance System (PMS) Item Number (SPIN) and the National Stock Number (NSN), which can be used to access the MSDS from the Hazardous Material Minimization Center (HAZMINCEN).

or

- Check Appendix C and find the SPIN from the Standard PMS Material Identification Guide (SPMIG) given on the Maintenance Requirement Card (MRC).

If in doubt, or if you cannot find the material in Appendices B or C – ask your supervisor for help. Since Appendices B and C contain all the PMS HM currently approved for shipboard use, as listed on the master Shipboard HM List (SHML), you may need to ask your HAZMINCEN Supervisor if the material that you are planning to use is allowed onboard the ship.

2. Turn to the specified group and carefully read all of the following before using the material:

- Risk Assessment
- Compatibility Information
- Control Measures
- Precautions
- Health Hazards
- Spill Control
- Disposal Guidelines

HM are most frequently used while conducting maintenance under the Planned Maintenance System (PMS). On each Maintenance Requirement Card (MRC) there are Safety Precautions and a Tools, Parts, Materials, and Test Equipment List. Every HM used for PMS has been assigned a Standard PMS Item Name (SPIN), which can be referenced to the Standard PMS Materials Identification Guide (SPMIG). The SPMIG contains stock numbers for all SPINs required for use while conducting PMS checks.

Ask your work center supervisor, the Safety Officer, or the HAZMINCEN Supervisor if you have any questions concerning the HM. NOTE: If the HM you work with cannot be identified with any group, consult the Material Safety Data Sheet (MSDS), your work center supervisor, the Safety Officer, or the HAZMINCEN Supervisor for more information.

EXPLANATION OF VARIOUS HAZARDOUS MATERIAL LABELS

Besides the manufacturer's label, you may see other labels that alert the user to the hazardous properties:

Department of Transportation (DOT) SYMBOLS

The following Department of Transportation (DOT) symbols are commonly used on HM shipping containers. These symbols are used by transportation companies for shipping requirements and spill response. They can also help you quickly recognize the type of chemical hazards present before opening the packaging. This may give users insight into the method of storage and handling required. Therefore, exercise the following precautions for each symbol. The numbers located in the lower portion indicate the class of the material. Some symbols are used for several classes. The nine classes are:

1 Explosives
2 Gases: compressed, liquefied, or dissolved under pressure
3 Flammable liquids
4 Flammable solids, substances liable to spontaneous combustion, or substances which, in contact with water, emit flammable gas
5 Oxidizing substances and organic peroxides
6 Poisonous (toxic) and infectious substances
7 Radioactive material
8 Corrosives
9 Miscellaneous dangerous substances and articles

DOT labels provide all required elements for identifying the HM or for indicating the potential health effect in accordance with Navy and OSHA directives.

FLAMMABLE

- Stow in approved flammable storerooms or NAVSEA-approved flammable storage lockers (NSTM 670).
- Ensure adequate ventilation (portable or fixed) in all spaces where flammable material is in use.
- Avoid breathing vapors. Use a respirator if indicated - the material's MSDS, supplemented with this guide, must be used to determine the proper respirator and cartridge type.
- Never use near a heat source or a spark-producing device.

  - Symbol used for classes 2, 3, and 4.
- Smoking is prohibited in areas where flammable material is being used or stored.

POISON

- Stow all toxic materials in cool, dry, well ventilated spaces separated from acids, caustics, and oxidizers.
- Ensure all containers are sealed and protected from physical damage.
- Ensure adequate ventilation (portable or fixed) in all spaces where toxic material is in use.
- Avoid breathing vapors. Use a respirator if indicated - the material's MSDS must be used to determine proper respirator selection.

- Avoid contact with the eyes, skin, and clothing by wearing splash-proof goggles, gloves, and an apron.
- Smoking, drinking, eating, storing food and applying cosmetics are prohibited in areas where toxic materials are being stored/used.
- Symbol used for class 6.

CORROSIVE

- Stow corrosive materials in their original containers, separate from other materials, in an approved, designated chest/locker.
- Ensure corrosive materials are cushioned against shock.
- Never allow corrosive materials to come into contact with the skin, eyes, or clothing.
- Wear splash-proof goggles and full face shield, rubber gloves, boots, and apron when handling corrosive materials.

- Ensure adequate ventilation (portable or fixed) in all spaces where corrosive material is in use.
- Avoid breathing vapors from corrosive materials. Use a respirator if indicated -the material's MSDS, supplemented by this guide, must be used to determine the proper respirator and cartridge type.

- Symbol used for class 8.

OXIDIZER

- Stow oxidizers in cool spaces where maximum temperature does not exceed 100 degrees Fahrenheit.
- Ensure that oxidizers are not stored in the same compartment with combustible materials such as fuels, oils, greases, paints, or cellulose products.
- Never mix an oxidizer with another substance unless directed to do so.

- Ensure oxidizers are only handled or used by authorized personnel.
- Avoid contact with the eyes, skin, and clothing. Use splash-proof goggles, gloves, and an apron.
- Symbol used for class 5.

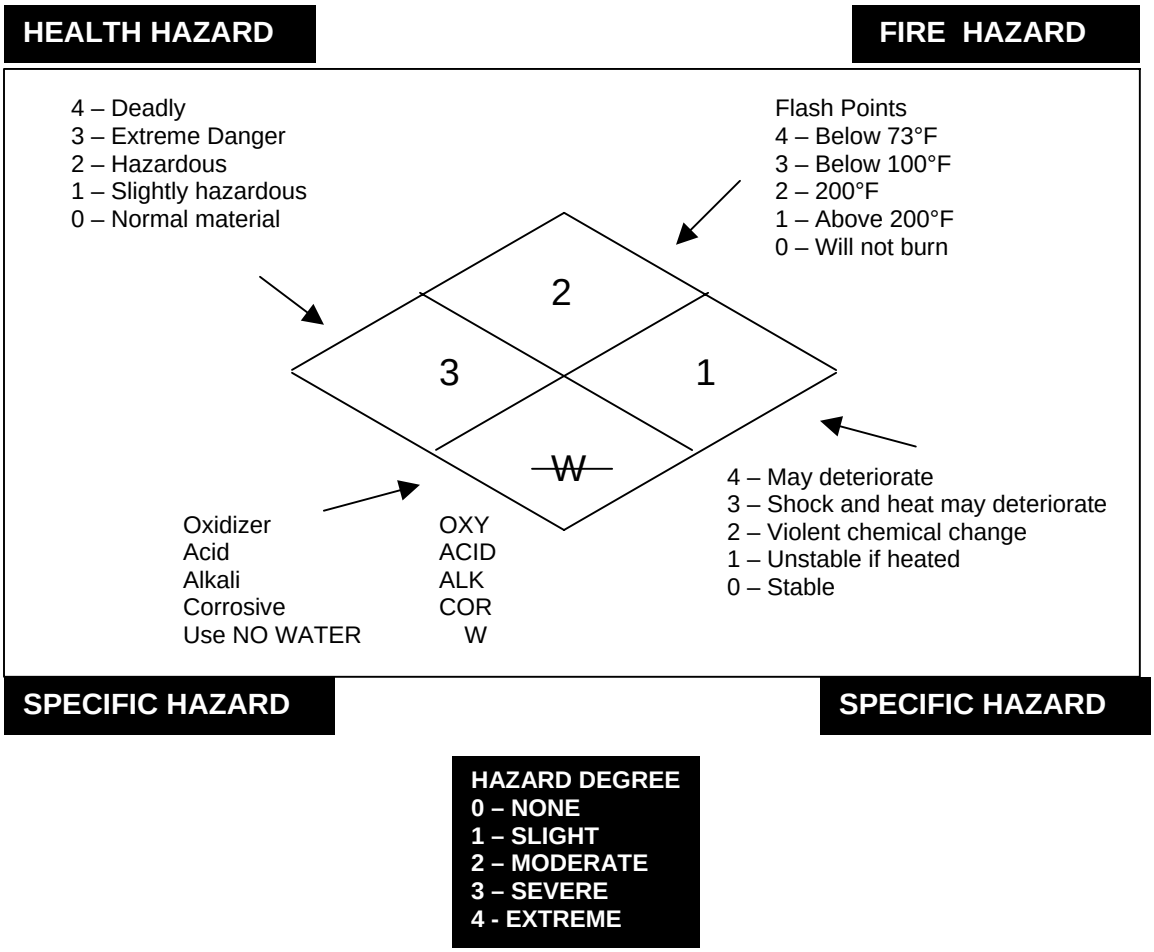
HARMFUL - STOW AWAY FROM FOODSTUFFS

- Stow all materials that are designated as “Harmful store away from foodstuffs” separate from food storage.

- Symbol used for class 6.

NATIONAL FIRE PROTECTION ASSOCIATION RATINGS

The National Fire Protection Association (NFPA) has created a system that assigns hazard ratings to materials. These supplementary hazard ratings can be used for guidance in handling and storing HM. You may see these labels on truck tank and rail cars, buildings, and in hardware stores. These labels are used to warn firefighters of materials contained within. Navy personnel may see these symbols and can



use the NFPA ratings as guidance, but **these are not substitutes for Navy required labels and do not meet Occupational Safety and Health Administration (OSHA) labeling requirements.**

Health Hazard (Blue) - Indicates whether the material may, directly or indirectly, cause permanent or temporary injury due to acute exposure by physical contact, inhalation, or ingestion.

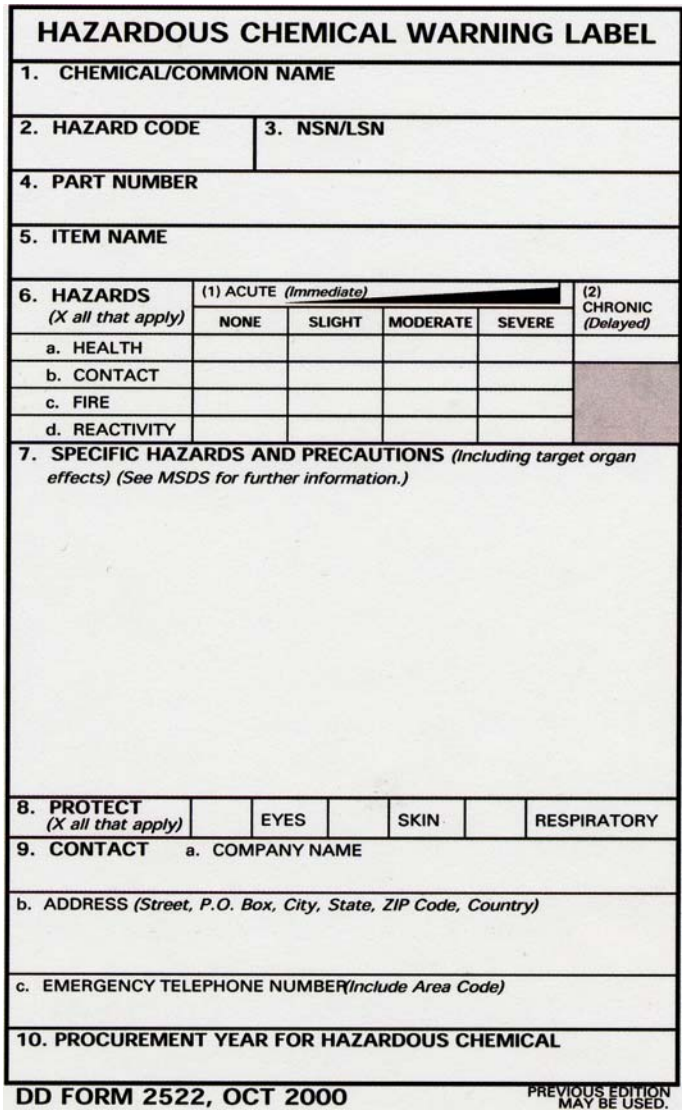
Fire Hazard (Red) - Indicates the material's relative susceptibility to fire burst, based on the form or condition of the material and its surrounding environment.

Reactivity (Yellow) - Shows the material's susceptibility to explosion through self-reaction or exposure to certain conditions or substances.

Specific Hazard (White) - Specifies special properties and hazards associated with the material. This is often useful during firefighting or emergency response.

DEPARTMENT OF DEFENSE HAZARDOUS CHEMICAL WARNING LABEL (DD FORM 2522)

Manufacturers are required by Federal law to properly label their HM. Materials purchased by the Navy are required to meet Federal law for labeling. The manufacturer-provided label should be used on a HM. If the HM is transferred from its original container to an unlabeled container, or if the original label is lost, damaged, illegible or destroyed, a Department of Defense Hazardous Chemical Warning Label should be used to identify the HM. Further information and the label are available from your HAZMINCEN. The label can be printed on plain paper. Labels are also available as pre-printed tractor-fed color labels for computers (5" x 7":NSN 7690-01-342-4849 and 8 1'2" x 11":7690-01-342-4850).



HAZARDOUS CHEMICAL WARNING LABEL

1. CHEMICAL/COMMON NAME

2. HAZARD CODE | 3. NSN/LSN

4. PART NUMBER

5. ITEM NAME

6. HAZARDS *(X all that apply)*	(1) ACUTE *(Immediate)* NONE	SLIGHT	MODERATE	SEVERE	(2) CHRONIC *(Delayed)*
a. HEALTH					
b. CONTACT					
c. FIRE					
d. REACTIVITY					

7. SPECIFIC HAZARDS AND PRECAUTIONS *(Including target organ effects) (See MSDS for further information.)*

8. PROTECT *(X all that apply)*		EYES		SKIN		RESPIRATORY

9. CONTACT a. COMPANY NAME

b. ADDRESS *(Street, P.O. Box, City, State, ZIP Code, Country)*

c. EMERGENCY TELEPHONE NUMBER *(Include Area Code)*

10. PROCUREMENT YEAR FOR HAZARDOUS CHEMICAL

DD FORM 2522, OCT 2000 PREVIOUS EDITION MAY BE USED.

APPLYING ORM TO HM

Operational Risk Management (ORM), under OPNAVINST 3500.39/MCO 3500.27A, establishes ORM as an integral part of Naval operations, training, and planning. By assessing the risks prior to undertaking an evolution, controls and risk avoidance are possible. ORM can be applied to handling and use of HM. Whether it is planning the acid cleaning of a boiler or piping system, clearing out a flammable liquid storeroom, or painting the side of a ship, risks associated with HM can be minimized if identified and evaluated beforehand. The 5-step process of ORM includes:

IDENTIFY HAZARDS

ASSESS RISKS

MAKE RISK DECISIONS

IMPLEMENT CONTROLS

SUPERVISE (WATCH FOR CHANGES)

Under each HM group will be a section on “Hazard Assessment”. That section contains common key points to consider when assessing the risks of handling that material.

In general, **before** an evolution or operation using HM, ask the following questions:

1. How hazardous is the material and how could it effect your health?

2. Do you know what personal protective equipment (PPE) is required and where to get that PPE?

3. Is the ventilation where you are working adequate to control gases or vapors from the operation?

4. Is temperature a consideration in using the HM, such as heat sources, flame, or fire?

5. Is the material corrosive, does it require an emergency deluge shower and/or emergency eyewash nearby?

6. Are you using the safest, least toxic material available to do that job?

7. Are you using the right material for the job?

8. Does your supervisor know what materials you are using and is an MSDS available?

9. What restrictions are set by the HAZMINCEN on dispensing, storage, and disposal of the material or waste?

10. If the material is in concentrated form, was it properly diluted before use?

11. If you get injured using the material, does anyone else know what you are working with and can hear your calls for help?

12. What materials should never be mixed and what could happen if they are?

13. Do I need a special container for left over or waste material?

14. What do you do if the material is not properly labeled?

To Apply ORM to potential **spill** situations, ask the following questions:

1. How much spillage constitutes a hazard?

2. When would you need to evacuate nearby personnel?

3. What is the first thing you should do if you spill the material?

4. Are there are ignition sources nearby?

5. Where do you find spill response or clean-up equipment, such as absorbents?

6. What PPE is needed to clean-up a spill and where do you get it?

7. What are the ventilation requirements for a spill of that material?

8. What do you do with all the waste from a spill clean-up?

9. Are you authorized to do a spill clean-up?

10. When should you contact Damage Control for a spill?

Risk management should be applied to every operation, whether it is cleaning parts or tearing down an entire hydraulic system. Even the most common cleaning evolution, such as stripping and waxing a deck, has risks.

For example: A sailor is told to take several five-gallon cans of solvent from Lower Flam Storage up to Paint Issue. The sailor is carrying two cans at a time. The ship takes a roll in heavy seas and one can is dropped down the ladder when the sailor loses his/her balance and grabs for a hand rail. The can breaks open and spills, and the sailor gets a bruised shin and twisted ankle.

If ORM had been applied to this operation:

IDENTIFY HAZARDS - The ship is in heavy seas
- The solvent is in heavy 5-gallon cans.
- There are several decks and ladders between Lower Flam Storeroom and the Paint Issue Room.
- Solvents are toxic and a fire hazard.

ASSESS RISKS – Should these cans be moved while the ship is experiencing heavy rolls?
- Is there a less hazardous way to move the cans, such as an elevator?
- Could the material spill or someone get hurt during the move?

MAKE RISK DECISIONS – Delay moving the cans until in calmer seas or inport.
- Use the elevator to move the cans.

IMPLEMENT CONTROLS – Use a working party to ease handling.
- Allow only one can to be carried at a time.
- Review spill procedures**.**

SUPERVISE (WATCH FOR CHANGES)

HM COMPATIBILITIES

HM are classified as “hazardous” because they have certain properties that make them flammable, reactive, corrosive, or hazardous to health. Materials with similar formulas or properties are normally compatible with one another – for example, we use a solvent to thin paint. The thinner is already a component of the paint. Mixing other materials may trigger an ***undesirable*** chemical reaction. If you have ever mixed vinegar (weak acid) with baking soda (weak caustic), you have seen the sudden bubbling reaction as carbon dioxide is given off. We consider these two materials “incompatible.”

While using HM, it is important to prevent incompatible materials from inadvertently coming into contact with one another. **The Material Safety Data Sheet (MSDS) will provide specific incompatibility information.** If incompatible materials are mixed or allowed to contact, they can react to generate heat, smoke, toxic gases, or cause a fire or violent explosion.

For example: People die each year from mixing ammonia-based cleaners (caustic) with bleach (oxidizer). The resulting chlorine gas is highly toxic.

A common incompatibility reaction results from oil or solvents coming into prolonged contact with combustible materials, such as cotton rags. Oil soaked rags can produce a thermal reaction called spontaneous combustion.

To prevent any accidental mixing of incompatible HM, observe the following guidelines.

1. Read all labels on the container for a HM prior to opening or use. Follow any instructions regarding incompatible substances. It will tell you which particular materials to avoid mixing.

2. **Never mix** HM unless specifically told to do so by a supervisor. This includes mixing both used and unused HM and material waste. Rags or empty containers may have enough residue to cause a reaction.

3. Properly dispose of used HM in designated containers. Ensure different materials are compatible before combining the wastes. Use designated oily waste cans and empty them nightly.

4. Adhere to storage guidelines. Store acids separately from bases; oxidizers away from combustibles and flammables; and compressed gases separately from other HM. Store dry materials, such as powders, above liquids or wet materials. Leaking liquids can drip down onto dry materials and cause a reaction.

5. Ensure containers of HM are properly sealed prior to storage or transport. Inspect storage containers periodically for leaks.

6. Use HM for their designated purposes only. For example, do not use solvents as a hand cleaner or fuel as a degreaser, unless specified in an MRC or technical manual.

7. Before dispensing any material into an empty container, such as spray bottle, ensure the material previously in that container was the same item or is compatible.

NAVOSHENVTRACEN COMPATIBILITY CHART

HMUG GROUP	HCC see note 2	GROUP NAME	EXAMPLES	INCOMPATIBLE MATERIALS	EXAMPLES	REACTION IF MIXED
1	C1, C2, C4, C5	ACIDS	Battery Acid Paint Removers De-Rust Spray	FLAMMABLES/ COMBUSTIBLES ALKALIS/BASES/CAUSTICS OXIDIZERS (HMUG Groups 2, 3, 4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 22)	Degreasers, Carbon Removers, Anti-Fogging Compounds	HEAT Gas Generation VIOLENT REACTION
2	F1 to F7, P1, T6, V3, V4	ADHESIVES	Epoxies Isocyanates Diethylenetriamine	ACIDS ALKALIS/BASES/CAUSTICS OXIDIZERS (HMUG Groups 1, 3, 18)		HEAT FIRE HAZARD
3	B1, B2	ALKALIES BASES/ CAUSTICS	Ammonia Sodium Hydroxide Cleaners	ACIDS/OXIDIZERS FLAMMABLES/COMBUSTIBLES (HMUG Groups 1, 2, 6, 8, 9, 10, 11, 14, 17, 18, 19, 20, 22)	Battery acid, Paint Removers, De-Rust Sprays, Paints, Solvents	HEAT Gas Generation VIOLENT REACTION
4	C1-C4, B1-B3, F2 to F7, T4, T6, V2-V4	CLEANING COMPOUNDS	Degreasers Carbon Removers Antifogging Compounds	DETERGENTS/SOAPS OXIDIZERS (HMUG Groups 1, 7, 18)	Calcium Hypochlorite, Sodium Nitrite, Hydrogen Peroxide	HEAT FIRE HAZARD
5	G1 to G9	COMPRESSED GASES	Acetylene, Propane, Nitrogen, Argon, Helium, Oxygen	HEAT SOURCES Consult paragraph C23 for specific handling and stowage guidance (HMUG Groups 8, 9, 10, 11, 12, 15, 18, 19)		FIRE HAZARD EXPLOSION HAZARD
6	F2 to F5, T6, V2, V3, V4	CORROSION PREVENTIVE COMPOUNDS	Corrosion Inhibitors Chemical Conversion Compounds	ACIDS/BASES OXIDIZERS IGNITION SOURCES (HMUG Group 1, 3, 18, 20)		FIRE HAZARD
7	B3	DETERGENTS/ SOAPS	Trisodium Phosphate Scouring Powders Disinfectants	ACID-CONTAINING COMPOUNDS (HMUG Groups 1, 4, 18)	Battery Acid, Paint Removers De-Rust Sprays	VIOLENT REACTION HEAT
8	F8, V6, V7	GREASES	Lithium Grease Silicone Molybdenum	OXIDIZERS ALKALIS/BASES/CAUSTICS (HMUG Groups 3, 5, 18)		FIRE HAZARD HEAT
9	T6, V4, V6, V7	HYDRAULIC FLUIDS	Petroleum-Based Synthetic Fire-Resistant	CORROSIVES, OXIDIZERS (HMUG Groups 1, 3, 5, 18)		VIOLENT REACTION
10	F2 to F4, T4, T6, V2-V6	INSPECTION PENETRANTS	Petroleum-Based Dyes	CORROSIVES, OXIDIZERS (HMUG Groups 1, 3, 5, 18)	Battery Acid Caustic Soda Chlorine laundry bleach Calcium Hypochlorite Hydrogen Peroxide OBA Canisters Paint Removers	EXPLOSION HAZARD
11	F4, T6, V2, V3, V4, V6	LUBRICANTS/ OILS	General Purpose, Gear, Turbine, Weapons			
12	F2 to F6, P1, T3, T4, T6, V1-V4	PAINT MATERIALS	Primers, Enamels, Urethanes, Lacquers, Varnishes, Non-Skid, Thinners	ACIDS, OXIDIZERS (HMUG Groups 1, 5, 18)		HEAT FIRE HAZARD
13	C1-C4, B1-B3, D1	PHOTO CHEMICALS	Developers, Stopbath, Toners, Bleaches, Replenishers	ACIDS HEAVY METALS (HMUG Groups 1, 18, 20)		HEAT FIRE HAZARD
14	F4	POLISH/WAX COMPOUNDS	Buffing Compounds Metal Polishes General Purpose Waxes	CORROSIVES OXIDIZERS (HMUG Groups 1, 3, 18)		HEAT, FIRE HAZARD VIOLENT REACTION
15	F2 to F6, T3, T4, T6, V1-V4	SOLVENTS	Methyl Ethyl Ketone (MEK) Toluene, Xylene Acetone	CORROSIVES OXIDIZERS BATTERIES (HMUG Groups 1, 5, 18, 21, 22)	Battery Acid Calcium Hypochlorite Sodium Nitrite Sodium Hydroxide	HEAT FIRE HAZARD
16	T6, T7, Z1	THERMAL INSULATION	Asbestos Fiberglass Glass Wool	MATERIAL IS NOT REACTIVE KEEP DRY		NO REACTION
17	C1-C4, B1-B3, D1	WATER TEST/ TREATMENT CHEMICALS	Nitric Acid Mercuric Nitrate Caustic Soda	CORROSIVES OXIDIZERS HEAVY METALS (HMUG Groups 1, 3, 18, 20, 21)		HEAT VIOLENT REACTION
18	D1 to D4	OXIDIZERS	Calcium Hypochlorite Laundry Bleach OBA Canisters	PETROLEUM BASED MATERIALS FUELS, SOLVENTS, CORROSIVES, HEAT (HMUG Groups 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, 22)		FIRE HAZARD VIOLENT REACTION EXPLOSION HAZARD TOXIC GAS GENERATION
19	F1 to F4, V4, V5, V6	FUELS	JP4, JP5 Gasoline Diesel Fuel	CORROSIVES OXIDIZERS (HMUG Groups 1, 3, 5, 18)	Battery Acid Calcium Hypochlorite Sodium Nitrite Sodium Hydroxide	FIRE HAZARD TOXIC GAS GENERATION
20	T6, V7, Z2	HEAVY METALS	Mercury Lead Beryllium	CORROSIVES OXIDIZERS WATER TREATMENT/PHOTO CHEMICALS (HMUG Groups 1, 3, 6, 13, 17, 18, 21)		VIOLENT REACTION GENERATION OF TOXIC AND FLAMMABLE GAS
21	Z4 to Z7	BATTERIES	Lead-Acid Dry-Cell Alkaline	SOLVENTS HEAVY METALS OXIDIZERS (HMUG Groups 15, 17, 18, 20)	Xylene Toluene Alcohol	HEAT VIOLENT REACTION TOXIC GAS GENERATION TOXIC
22	T2 to T6	PESTICIDES	Insecticides, Fungicides Rodenticides Fumigants	CORROSIVES OXIDIZERS (HMUG Groups 1, 3, 15, 18)		TOXIC GAS GENERATION

1. This chart is to be used as a ***GUIDE ONLY!***
2. Compare the desired HMUG Group/HCC in the left column with the Incompatible Material(s) of that Group in the center column on the same row. Mixing of the HMUG Group/HCC with the Incompatible Material(s) may result in the reaction(s) listed in the right column.
3. Not all applicable HCCs are listed; only the most frequently encountered HCCs (except N1) are listed.

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Note: A larger version of this chart is available on the website listed above.

EXPLANATION OF PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

The Personal Protective Equipment (PPE) requirements listed under each group in the Control Measures section are intended to increase your awareness of the need to wear protective equipment. The requirements are conservative, and reflect protection specific to the hazard and the type of handling expected.

PPE must be selected based on the severity of the hazard and probability that it could happen - the Risk Assessment. Before selecting PPE, you or your supervisor needs to assess the risk, or apply Operational Risk Management (ORM) to the job. On many routine jobs, this risk assessment may already have been conducted by the Safety Officer or during a baseline industrial hygiene survey. Maintenance Requirement Cards (MRCs) list PPE based on a risk assessment of the procedure listed on the card.

**YOU CAN ALWAYS USE MORE,
BUT NEVER LESS,
PPE THAN WHAT IS CALLED FOR
ON THE MRC.**

Types of PPE specified in the HMUG include:

RESPIRATORS — The respirator must be selected for the hazard. The command's Respiratory Protection Manager (RPM) will make those decisions and advise you and your supervisor of respirator requirements. Users must be medically screened, trained, and fit-tested prior to using a respirator. Selection of respirators will be made in accordance with the guidance provided by the Industrial Hygiene Survey, available to the RPM. The RPM will evaluate the process and apply applicable IH Survey guidance.

HAND PROTECTION — Hand protection is selected for the hazard. This can range from barrier creams to full gauntlet rubber gloves. Chemical gloves are made of materials tested to ensure the chemical does not penetrate or damage the glove material on prolonged exposure. Gloves are selected according to the material being used and the duration of exposure. The acceptable levels of hand protection will be listed, but consult the Material Safety Data Sheet (MSDS) or your Safety Officer for specifics and possible substitutions.

FOOT PROTECTION — Even though most sailors wear steel toe boots daily while at work, there may be hazards where a rubber over-shoe or other foot protection is required. Anti-static, chemical resistant, and slip-resistant footwear may be specified for certain jobs with certain HM.

EYE PROTECTION — Eye protection includes safety glasses, splash-proof chemical goggles, impact goggles, UV goggles, welding helmets with special lenses, etc. Selection of the right eye protection depends on the hazard and the risk. In

	general, for all HM use, chemical goggles will protect the eyes from contact with liquid and powdered chemicals.
FACE PROTECTION	Face shields are not eye protection – they are face protection. Eye protection must be worn beneath face shields.
SKIN/BODY PROTECTION	This includes rubber aprons, protective coveralls, TYVEK or coated sack suits, and head coverings. The material of the protective clothing is selected for the hazard and the risk. Strong solvents will soak through cotton coveralls but not a rubber apron or chemical-spill protective coverall.

NOTE: Be sure to tell your supervisor if PPE is damaged or defective. Replace before using.

CLEANING OR DISPOSAL OF CONTAMINATED PPE:

Any protective equipment that is contaminated with HM must be thoroughly cleaned or properly disposed of after use.

- Other PPE may be required when handling contaminated PPE.
- Some contaminated PPE may require special disposal – consult the HAZMINCEN supervisor.
- Consult your supervisor or Safety Officer for handling, cleaning, and disposal requirements.

PPE USED FOR PMS:

The Maintenance Requirement Card (MRC) will specify required PPE for a specific maintenance action. The PPE for PMS has been assigned a Standard PMS Item Name (SPIN), which can be referenced to the Standard PMS Materials Identification Guide (SPMIG). The SPMIG contains stock numbers for all SPINs required for use while conducting PMS checks. Appendix A, the Personal Protective Equipment Shopping Guide, has a cross-referenced list of the SPMIGs for PPE.

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DISPOSAL OF HM

Disposal Guidelines on MRCs:

With the establishment of HAZMINCENs ashore and afloat, efforts to reduce hazardous waste, and the tightening of rules concerning HM disposal, the decisions on disposal of excess and waste material are normally made by HAZMINCEN personnel.

You will be advised to comply with your own ship/station procedures for handling the disposal of hazardous material/waste, including contaminated towels, absorbents, containers, and clothing.

HAZMINCENs afloat follow the guidance in OPNAVINST 5090.1 series, Appendix L – Disposal of Shipboard Hazardous Material, OPNAVINST 5100.19D, chapters C23 and D15, and local port disposal procedures.

Shore HAZMINCENs will comply with local activity disposal procedures and OPNAVINST 5100.23F, chapter 7.

Used HM, including rags, containers, and debris must be turned in to the HAZMINCEN or disposed of in accordance with local activity disposal procedures.

Disposal instructions are also provided on PMS Maintenance Requirement Cards (MRCs). One or more of the following Disposal Methods will appear if a HM is required by an MRC:

Method 1: If shipboard HAZMINCEN exists, turn in all spent HM and items contaminated with HM to the shipboard HAZMINCEN for collection, processing, and disposal. Containerize waste in original container or use standard container as listed in Appendix C23-A of OPNAVINST 5100.19D "Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat" and the Naval Ships' Technical Manual (NSTM), S9086-TO- STM-010/CH-593, Pollution Control. Store in accordance with OPNAVINST 5100.19D, Appendix C23-C and D15-E. Mark, label, or tag the container with the specific contents and any information on the contaminants. This information must also be provided on the DD Form 1348-1A at the time of off-loading. Empty container guidance is available in the CNO Policy Guide for Shipboard Hazardous Material Container Disposal, OPNAV P-45-114-95. Contact the receiving shore activity (e.g., Fleet and Industrial Supply Center and Public Works Center) to determine the appropriate local off-loading requirements.

Method 2: DELETED.

Method 3: If shipboard HAZMINCEN exists, turn in all spent HM and items contaminated with HM to the shipboard HAZMINCEN for collection, processing, and disposal. Overboard discharges permitted in accordance with guide lines set forth in Appendix L of OPNAVINST 5090.1B, "Environmental and Natural Resources Program Manual". Contaminated items must be disposed of in accordance with the disposal requirements of the contaminant. If material is an acid or an alkali, follow neutralization instructions in Naval Ships' Technical Manual (NSTM) S9086-T8STM-010/CH-593, Pollution Control. Store packaging and container for reuse or dispose as solid waste, in accordance with OPNAVINST 5090.1B and NSTM, Chapter 593. Empty container guidance is available in CNO Policy Guide for Shipboard Hazardous Material Container Disposal, OPNAV P-45-114-95.

Method 4: If shipboard Hazardous Material Minimization Center (HAZMINCEN) exists, turn in all spent HM and items contaminated with HM to the shipboard HAZMINCEN for collection, processing, and disposal. Guidance for shipboard expired or spent material is provided in NSTM S9086-T8-STM-010 chapter 593 "Pollution Control" and Appendix L of OPNAVINST 5090.1B, "Environmental and Natural Resources Program Manual". Discharge after seal is removed. Containerize in original container, if possible, or use standard container as listed in Appendix C23-A of OPNAVINST 5100.19D, "Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat" and NSTM S9086-T8-

STM-010/CH-593, Pollution Control. Mark, label, or tag the container with specific contents. This information must also be on DD from 1348-1A at time of off loading. Contact the receiving shore activity (e.g., FISC and PWC) to determine the appropriate off-loading requirements.

Method 5: Label and store canister for reuse or disposal ashore as specified in OPNAVINST 5100.19D, "Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat", Volume II, Sections C2311 and D1510. This information must also be on DD form 1348-1A at time of off loading. Contact the receiving shore activity (e.g., FISC and PWC) to determine the appropriate local off-loading requirements.

Method 6: If shipboard HAZMINCEN exists, turn in all spent HM and items contaminated with HM to the shipboard HAZMINCEN for collection, processing, and disposal. Properly wet waste to prevent creating airborne particles or dust; then place in an approved plastic bag and seal. Mark with standard asbestos CAUTION labels as specified in OPNAVINST 5100.19D, "Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat", Volume I, Section B0104. This information must also be on DD form 1348-1A at time of off loading. Dispose in accordance with OPNAVINST 5090.1B, Appendix L. Contact the receiving shore activity (e.g. FISC and PWC) to determine the appropriate local off-loading requirements.

GROUP 1: ACIDS

The acids group includes organic acids (e.g., citric acid, cresylic acid, acetic acid), inorganic acids (e.g., sulfuric acid, nitric acid), and other acid-containing materials (e.g., battery refill kits, paint removers, de-rust sprays).

Safety guidance and personal protective equipment (PPE) suitable for the corrosive/irritant nature of materials in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and adverse health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Acid is corrosive to the skin and eyes – prevent contact by handling carefully and wearing PPE.
- Someone splashed with acid may be in pain and disoriented – personnel should not work alone!
- Acids are highly reactive – know the emergency spill and response procedures.
- Acid is corrosive and emergency eyewash stations and deluge showers are required in areas where corrosives are handled.

COMPATIBILITY INFORMATION

GROUP 1 Acids are incompatible with Flammables, Combustibles, Alkalis, Bases, Caustics and Oxidizers (Groups 2, 3, 6, 7, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, and 22).

CONTROL MEASURES	**PPE**
1. Ensure that general ventilation (fixed or temporary) exists in the vicinity of areas where acids are being used or in situations where large quantities of acid are open to the air.	
2. When charging lead-acid batteries, ensure local exhaust ventilation is in operation prior to beginning work. When charging batteries, exhaust ventilation systems are normally interlocked to operate while the charger is energized.	
3. When working with any acids, wear a long-sleeve shirt with the sleeves rolled down.	
4. When using liquid or powdered acids in an environment where acid gases or dust may be inhaled, you may be required to wear a respirator – consult your Respiratory Protection Manager (RPM).	**RESPIRATOR** (situational)
5. Wear acid resistant gloves at all times while working with acids.	**HAND PROTECTION** (mandatory)
6. Wear splash-proof chemical goggles at	

all times while using acids or in the immediate vicinity (splash range) of acid use (for instance, dip tank or battery refill operations).

EYE PROTECTION
(mandatory)

7. Use a face shield in addition to goggles for face and neck protection (especially when pouring or mixing acid solutions).

FACE PROTECTION
(situational)

8. When shoes may come in contact with the acid or acid solutions (for instance, deck stripping with acidic stripper) wear acid-resistant rubber boots.

FOOT PROTECTION
(situational)

9. Wear an acid-resistant rubber apron when pouring or working with strong/concentrated acid solutions or powders.

SKIN/BODY PROTECTION
(situational)

PRECAUTIONS: (Acids)

1. Avoid skin, eye, and clothing contact with acids.

2. Avoid breathing acid gases or dust.

3. Always maintain as much distance as possible between you and the acid. If your clothing comes into contact with an acid, wash with copious amounts of water and immediately change into a clean set of clothing.

4. When working with acids, acidic cleaners, or any laboratory chemicals, ensure that the correct concentration is used. Follow all dilution and mixing directions.

5. Always add an acid slowly to water ("A" comes before "W"—acid into water). NEVER ADD WATER TO ANY ACID – there could be an immediate heating reaction and surface splatter of acid out of the container.

6. Never mix an acid with another substance unless specifically instructed by written procedures.

7. Use the particular acid only for its intended purpose. Do NOT use any acid material for unauthorized applications.

8. Return all acids to proper storage upon completion of a job. NEVER STORE ACIDS AND BASES/CAUSTICS TOGETHER.

9. Ensure that empty acid containers are not used for any other purpose. Comply with your own ship/station HAZMINCEN procedures for handling the disposal of empty HM containers.

10. Store acids separately, only in cool, dry areas such as acid storerooms, acid lockers, and storage battery shops.

11. Store inorganic acids in their original glass containers or approved plastic containers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or consult with your supervisor for approved containers.)

12. Store organic acids in an acid locker in the flammable storeroom separated by a partition or by at least three feet from all other materials. Keep separately from inorganic acids. Make sure that all acid containers are cushioned against shock. Protect containers from physical damage.

13. Avoid freezing organic acids.

14. Keep acids away from heat and direct sunlight, metal surfaces, and oxidizing agents.

HEALTH HAZARDS:

1. Skin contact with acids can range from a minor skin rash to very painful chemical burns. The skin may also absorb organic acids, which are toxic in small amounts, directly into the body.

If acids contact the skin, wash the affected area immediately with a large amount of water for 15 minutes. Remove clothing contaminated with concentrated acid immediately. If necessary, go to the nearest emergency deluge/safety shower, remove contaminated clothing, and stand under the shower for 15-20 minutes. Get medical attention immediately, even if the injury does not seem severe.

2. Breathing acid gases or dust can irritate or severely damage the lining of the nose, throat, or lungs.

If you experience breathing discomfort (coughing/choking) or irritation in the nose, throat, or lungs while using acids, stop work and go to an area with fresh air. Obtain medical attention immediately.

3. Eye contact with acids can cause discomfort, burns, or even loss of vision.

If acids contact the eyes, immediately go to the nearest emergency eyewash. Flush the eyes, including under the eyelids, for at least 15 minutes. Get medical attention immediately, even if the injury does not appear to be severe.

4. Ingestion of acids can burn the mouth, corrode the teeth, and cause internal bleeding in the esophagus and digestive tract.

If an acid is accidentally swallowed, immediately obtain medical assistance. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Clear all unprotected persons from the area of the acid spill

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is acid resistant gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer about additional PPE requirements.

3. Secure the source of the leak if it can be done without risk. Neutralize the acid spill with a weak base such as sodium bicarbonate (baking soda), soda ash, or lime. (Never use a strong base or an ammonia base to neutralize acids.) Have the spill tested for pH to determine if the spill is adequately neutralized (pH = approximately 7).

4. Once the spill is neutralized and diluted, the spill may be flushed overboard or into the sewage system using large amounts of water.

5. If a spill involves battery electrolytes or acids containing lead or other heavy metals, containerize the residue for proper shore disposal. DO NOT flush into the sewage system. Use acid-compatible/universal spill absorbents and containerize for disposal.

6. Flush acid-spill areas with large amounts of water and ventilate areas well to release any irritant acid gases. Avoid breathing the gases.

7. If a spill involves a fire, report the fire in accordance with established procedures. Use carbon dioxide or a dry chemical extinguisher to fight the fire. (NOTE: DO NOT use water to control sulfuric acid fires.)

NOTE: Wear an oxygen breathing apparatus (OBA) or a self-contained breathing apparatus (SCBA) when fighting a fire involving acids.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station HAZMINCEN procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Store used/excess acid materials in approved, labeled containers pending disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendices A and B for approved containers).

4. Spent acids may be neutralized with a weak base, diluted with water, and flushed overboard or into the sewage system using large amounts of water, if directed by the HAZMINCEN.

5. Battery electrolytes and acids containing lead or other heavy metals must be containerized for shore disposal in accordance with NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D).

6. Cotton rags contaminated with acids are at risk for spontaneous combustion. Turn them in to the HAZMINCEN after use.

GROUP 2: ADHESIVES

The adhesives category includes items such as glue, rubber cements, epoxy adhesive, sealing compounds, gasket shellac compounds, and the adhesives found in life raft repair kits.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in adhesive materials are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Most adhesives give off strong vapors – the usage area must be ventilated.
- Epoxy two-part systems give off heat as they cure, can burn skin, and may also create a fire hazard.
- Many adhesives are flammable.
- The vapors in some adhesives can interact with prescription drugs.
- The resin part of an epoxy system reacts with oxidizers – avoid the use of hydrogen peroxide in any first aid involving resins.
- Safety observers need to be aware that some adhesives contain chemicals that cause a sensitivity (allergic) reaction in certain individuals.
- Adhesives, especially aerosols, can be abused for their narcotic effect and should be in secure storage.

COMPATIBILITY INFORMATION

GROUP 2 adhesives are incompatible with Acids, Alkalis, Bases, Caustics, and Oxidizers (Groups 1,3, and 18).

CONTROL MEASURES	PPE
1. Ensure that good general ventilation (fixed or temporary) is in operation when applying adhesives. Larger, routine operations may require a dedicated exhaust system.	
2. When applying aerosol-propelled adhesives in areas where there is inadequate ventilation, see your Respiratory Protection Manager about the need to wear a half-face air-purifying respirator equipped with organic vapor (black-coded) cartridges.	**RESPIRATOR** (situational)
3. Wear chemical-splash goggles when applying liquid or aerosol adhesives (especially when working at eye-level or overhead areas).	**EYE PROTECTION** (required)
4. Use neoprene or rubber gloves if hand/skin contact is expected or possible. (DO NOT use gloves or bare hands as an adhesive	**HAND PROTECTION** (required)

applicator.) Avoid prolonged skin contact.

5. Individuals who are known to be skin-sensitive to adhesive compounds should wear a long-sleeved shirt and apply protective skin cream to exposed parts of the body when working with adhesives containing chemicals which may cause allergic reactions (sensitizers). Read the material label and the MSDS for specific warnings.

SKIN/BODY PROTECTION
(situational)

PRECAUTIONS: (Adhesives)

1. Avoid skin contact with adhesives or sealants.

2. Avoid breathing adhesive vapors.

3. If using an adhesive from an aerosol can, ensure that the nozzle arrow is pointed away from you.

4. Use a particular adhesive/sealant only for its intended purpose. DO NOT use adhesives for any unauthorized application.

5. Avoid exposure of adhesives to sources of ignition such as sparks, open flame, and heat, particularly if the adhesive is in an aerosol can.

6. Store aerosol, flammable, or petroleum-based adhesives in the flammable liquids cabinets or store rooms when not in use.

7. DO NOT store aerosol adhesives in areas with temperatures above 120 degrees Fahrenheit or adjacent to steam lines or hot machine surfaces.

HEALTH HAZARDS:

1. Epoxies, isocyanates, and diethyl triamine are examples of sensitizing chemicals commonly found in adhesives. Sensitizers can stimulate allergic-like reactions in susceptible individuals. Read the adhesive label for warnings of sensitizing ingredients.

If adhesives contain sensitizers, susceptible individuals should use barrier skin cream before using the adhesive. (A noticeable allergic skin or respiratory response may be delayed in susceptible individuals.)

2. Skin contact with an adhesive can range from a minor skin rash to severe chemical burns.

If adhesives contact unprotected skin, immediately wash the affected areas with soap and water.

Read the label or MSDS to determine what solvent or cleaner should be used to remove adhesives from the skin. DO NOT use gasoline, JP-5 or other fuels to clean adhesives off skin.

If a skin rash develops, report the incident to a supervisor and seek medical attention.

3. Prolonged, repeated exposure to adhesive vapors can irritate the eyes, nose, throat, or lungs.

If the eyes become itchy or watery, or if dizziness or irritation in the nose, throat, or lung are experienced while using adhesives, stop work and go to an area with fresh air. Report the condition to a supervisor. Seek medical attention if necessary.

4. Eye contact with adhesives may result in discomfort or even loss of vision.

If adhesives contact the eyes, stop work and go immediately to the nearest emergency eyewash station. Flush the eyes including under the eyelids for at least 15 minutes. Get medical attention immediately, even if the injury does not seem severe.

5. Ingestion of adhesives can cause internal damage to the digestive tract.

If an adhesive is accidentally swallowed, immediately obtain medical assistance. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the spill area.

2. Remove all sources of ignition (open flames, hot surfaces, static electricity, or frictional/grinding sparks).

3. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor or the Safety Officer for additional PPE requirements.

4. Collect the spilled adhesive, using inert absorbents such as sponges and rags, and place into a labeled container pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved waste HM containers.)

5. Wash adhesive-spill areas with a suitable organic solvent such as acetone or an alcohol, and ventilate the areas well to release solvent vapors. Avoid breathing solvent vapors. DO NOT use solvent to remove adhesives from the skin.

6. If an adhesive spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguishers to fight fires.

NOTE: Wear an oxygen breathing apparatus (OBA) or self contained breathing apparatus (SCBA when fighting a fire.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures HAZMINCEN for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Store used/excess adhesive material (including contaminated rags, absorbents, and applicators) as used flammable materials in approved, labeled containers, pending shore disposal. Consult your HAZMINCEN for guidance.

GROUP 3: ALKALIS/BASES/CAUSTICS

The alkalis/bases/caustics group includes ammonia, ammonium hydroxide, sodium hydroxide, potassium hydroxide, sodium bicarbonate, trisodium phosphate, and certain cleaners and detergents.

Safety guidance and personal protective equipment (PPE) suitable for the caustic/irritating nature of materials in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of PPE you need for a particular job.

RISK ASSESSMENT

- Caustic materials are corrosive to the skin and eyes. Prevent contact with careful handling and PPE.
- Someone splashed with a caustic material may be in pain and disoriented. They should not work alone!
- Caustic materials are reactive. Know the emergency spill and response procedures.
- Caustic materials can continue to cause skin damage even after washed off – damage may progress, so medical attention is mandatory. Having an emergency eye wash station or deluge shower, placed where it can be reached in 10 seconds or within 100 feet of the work area, is critical.

COMPATIBILITY INFORMATION

GROUP 3 alkalis/bases/caustics are incompatible with Acids, Oxidizers, Flammables, and Combustibles (Groups 1, 2, 6, 8, 9, 10, 11, 12, 14, 15, 17, 18, 19,20, and 22).

CONTROL MEASURES	PPE
1. When working with strong alkali/bases in liquid form, wear a long sleeved shirt with the shirt sleeves rolled down.	
2. When working with ammonia or ammonium hydroxide in an area with poor ventilation, consult the Respiratory Protection Manager about the need for a half-face air-purifying respirator equipped with ammonia (green-coded) cartridges.	**RESPIRATOR** (situational)
3. When working with powdered alkali in a situation in which an airborne dust may be inhaled, consult the Respiratory Protection Manager about the need for a particulate respirator.	**RESPIRATOR** (situational)
4. Wear rubber gloves at all times while working with alkali/base/caustic materials.	**HAND PROTECTION** (mandatory)
5. Wear splash-proof chemical goggles at all times while working with alkali/	**EYE PROTECTION** (mandatory)

base/caustic material or in the vicinity (within splash distance) where caustics are being used.

6. Use a face shield in addition to eye goggles for face and neck protection when pouring or mixing alkali/base/caustic solutions that may splash the face.

FACE PROTECTION
(situational)

7. When working with quantities of strong alkali/base or caustic solutions, or where shoes may come in contact with the solution, wear rubber boots.

FOOT PROTECTION
(situational)

8. Wear a rubber apron when pouring or working with strong alkali/base/caustic solutions that may splash on the body.

SKIN/BODY PROTECTION
(situational)

PRECAUTIONS: (Alkali/Bases/Caustics)

1. Avoid clothing, skin, and eye contact with alkali/bases/caustics.

2. Avoid breathing alkali/base/caustic gases or dusts.

3. Always maintain as much distance as possible between you and the alkali/base/caustic. If your clothing comes into contact with an alkali/base/caustic, rinse well with copious amounts of water and change into a clean set of clothing immediately.

4. Before using bases or basic cleaners, make sure that the correct concentration is being used. Follow all dilution directions. This is especially important for concentrated cleaners that must be diluted prior to use.

5. Use the particular alkali/base/caustic only for its intended purpose; DO NOT use any base for unauthorized applications.

6. Never mix an alkali/base/caustic with another substance unless you are instructed to do so by written procedures.

7. Return all alkali/bases/caustics to proper storage upon completion of the job. (NEVER STORE ACIDS AND BASES TOGETHER.)

8. Store alkali/bases/caustics only in designated cool, dry areas.

9. Store alkali/bases/caustics in original glass or approved plastic containers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D, Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

10. Keep alkali/bases/caustics away from heat (and out of direct sunlight), metal surfaces, and oxidizing agents.

HEALTH HAZARDS:

1. Skin contact with alkali/bases/caustics can cause effects ranging from minor skin rashes to very painful chemical burns.

If alkali/bases/caustics contact the skin, wash the affected areas immediately with large amounts of water for at least 15 minutes. A longer period may be required to remove the soapy feeling from the skin. If necessary, go to the nearest emergency shower; remove contaminated clothing and stand under the shower for 15 minutes. Get medical attention immediately, even if the injury does not seem severe. Caustic burns are penetrating and can continue to damage skin even after removing the material from the skin's surface.

2. Breathing alkali/base/caustic gases or dusts can irritate or severely damage the lining of the nose, throat, or lungs.

If you experience breathing discomfort (coughing/choking) or irritation in the nose, throat, or lungs while using an alkali/base/caustic, stop work and go to an area with fresh air. Obtain prompt medical attention.

3. Eye contact with alkali/bases/caustics may burn the eyes and cause permanent eye damage or blindness.

If alkali/bases/caustics contact the eyes, stop work and immediately go to the nearest emergency eye-wash. Flush the eyes including under the eyelids, for at least 15 minutes. Obtain medical attention immediately, even if the injury does not seem severe. Caustic materials are readily absorbed by the eye. Even after 15 minutes of flushing, there could be enough material in or on the eye tissue to continue damaging the eye.

4. Ingestion of alkali/bases/caustics can cause severe damage to the mouth, teeth, and digestive tract. This is a medical emergency. Ingested caustics can continue progressive damage to tissues.

If an alkali/base/caustic is accidentally swallowed, immediately obtain medical assistance. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person. If drinking water is available, rinse mouth immediately with a glass of water. THIS IS A MEDICAL EMERGENCY.

SPILL CONTROLS:

1. Evacuate all unprotected persons from the spill area.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is acid/corrosive resistant gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Stop the leak or spill source if it can be done without risk.

4. Neutralize the spill with a weak acid such as diluted acetic acid (vinegar). Never use strong acid to neutralize alkali. Have the spill tested for pH to determine if the spill is adequately neutralized (pH should = approximately 7).

5. Collect the spill using absorbents and store used absorbents and other used/excess materials in properly labeled containers pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593 Appendix A and Appendix B for approved waste containers.)

6. Flush the spill area with large amounts of water and ventilate the area well to release vapors. Avoid breathing the vapors.

7. If an alkali/base/caustic spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide or dry chemical extinguishers to fight the fire.

NOTE: Use an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) for fighting fires involving alkali/bases/caustics.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station HAZMINCEN procedures for handling the disposal of HM and contaminated rags, absorbents, containers and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Store excess alkalis/bases/caustics in approved containers pending shore disposal. Consult your HAZMINCEN for guidance.

4. Spent alkali/bases/caustics may be neutralized with a weak acid such as vinegar (diluted acetic acid) and flushed overboard or into the sewage system using large amounts of water, if directed by the HAZMINCEN.

5. Alkaline batteries must be containerized for shore disposal. DO NOT empty the electrolyte from the battery.

GROUP 4: CLEANING COMPOUNDS

The cleaning compounds group includes general purpose cleaners, glass cleaners, degreasers, carbon removers, lens fluid, and antifogging compounds. Cleaners come in several forms, such as aerosols, concentrates, pump sprays, and in sealed packets.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about the type of safety equipment you should wear for a particular job.

RISK ASSESSMENT

- Cleaning compounds are used by sailors more than any other type of HM. Because they are so common, many users do not take the hazards seriously, leading to mishaps and exposures.
- Highly concentrated cleaners are required to be diluted with water. Using them at full strength greatly increases the risk of injury.
- Lack of eye and hand protection is the root cause of most HM cleaner injuries.
- A cleaner in an unlabeled or incorrectly labeled container is a “booby trap” for shipmates.
- Although some cleaning materials have a low toxicity, because their use is a condition of employment, the Navy is responsible for their safe use and warning sailors of any hazards.

COMPATIBILITY INFORMATION

GROUP 4 cleaning compounds are incompatible with Detergents/Soaps and Oxidizers (Groups 7 and 18.)

CONTROL MEASURES	PPE
1. Ensure that general ventilation (fixed or portable) is in operation in the vicinity of the area where cleaning compounds are being used.	
2. When using cleaning compounds in a situation where the solvent vapors are in the breathing zone and may be inhaled, when using aerosol cleaners, or when working in a tank or void with poor ventilation, consult your Respiratory Protection Manager (RPM) to see if you may need a respirator.	**RESPIRATORS** (situational)
3. Wear rubber gloves on jobs where the hands may come in contact with cleaning compounds. Avoid prolonged skin contact with any cleaner.	**HAND PROTECTION** (mandatory)
4. Wear splash-proof chemical goggles when using cleaning compounds (especially when applying cleaning compounds at eye level or overhead or when using	**EYE PROTECTION** (mandatory)

cleaning compounds from an aerosol can).

5. Use a face-shield in addition to the goggles if splashing is expected, such as pouring cleaning compound out of a larger container or diluting concentrated cleaners.

FACE PROTECTION (situational)

PRECAUTIONS: (Cleaning compounds)

1. Avoid repeated and prolonged skin contact with cleaning compounds.

2. Prevent eye contact with cleaning compounds.

3. Avoid breathing the vapors or mists generated from cleaning compounds.

4. Keep cleaning compound containers closed when not in use.

5. Use a cleaning compound only for its intended purpose. DO NOT use any cleaning compounds for unauthorized applications.

6. DO NOT use cleaning compounds on hot surfaces unless instructed by directions.

7. Use and store cleaning compounds in areas free from sources of ignition, sparks, or an open flame, and oxidizers such as calcium hypochlorite, sodium nitrate, and hydrogen peroxide. DO NOT store aerosol cleaning compounds in areas with temperatures above 120 degrees Fahrenheit.

8. If using cleaning compounds from aerosol cans, ensure that the nozzle arrow is pointed away from the face.

9. Keep cleaning compounds in original containers, and do not place them in containers that previously contained incompatible materials. Ensure containers are tightly closed.

10. Store aerosol and flammable cleaning compounds in designated flammable liquid storerooms, cabinets, or lockers.

11. Do not combine different cleaning compounds unless specified in the manufacturer's instructions.

HEALTH HAZARDS:

1. Cleaning compounds are frequently mixtures of various corrosive/hazardous chemicals. Read the original container label for warnings about dangerous ingredients, such as methylene chloride, phenol, and cresol.

If cleaning compounds contain hazardous ingredients, use them with extra caution. Toxic chemicals such as phenol and cresol can present a very serious health hazard to personnel exposed to the vapors or as a result of skin contact with these materials. Exercise extreme caution and use all prescribed PPE when working with these substances.

PREGNANT WORKERS should consult with their treating physician(s) prior to using any cleaning compounds.

2. Cleaning compounds can cause skin damage by dissolving the oils in the skin. Others can be absorbed through the skin and long-term exposure can produce internal damage.

If your skin gets red, dry, irritated, or forms cracks/blisters from using cleaning compounds, wash affected areas with soap and water. Report the skin condition to a supervisor and get medical attention.

3. Prolonged inhalation of cleaning compound vapors and mist can irritate the eyes, nose, throat, and lungs. Long-term exposure to cleaning compound vapors may result in liver, kidney, lung, and brain damage.

If the eyes are itchy or watery, or if dizziness or irritation in the nose, throat, or lungs are experienced while using cleaning compounds, stop work and go to an area with fresh air. Report the incident to a supervisor and seek medical attention.

4. Eye contact with cleaning compounds can result in discomfort, eye damage, or even loss of vision.

If cleaning compounds contact the eyes, stop work and immediately go to the nearest emergency eye-wash station. Flush the eyes including under the eyelids for at least 15 minutes. Obtain medical attention immediately, even if the injury does not seem severe.

5. Ingestion of cleaning compounds can cause very painful burns to your mouth, throat, and digestive tract.

If a cleaning compound is accidentally swallowed call for immediate medical assistance. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the spill area.

2. Remove all sources of ignition such as open flame, hot surfaces, static electricity, or frictional/grinding sparks.

3. Ensure that PPE such as goggles, faceshield, gloves, and required respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves, splash-proof chemical goggles, and respirator, if indicated by the Respiratory Protection Manager. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

4. Collect the spilled cleaning compound using pumps or absorbents, and store used absorbents and other related used/excess materials in labeled containers pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D, Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Wash areas where cleaning compounds have been spilled with water, and ventilate areas well to dilute and remove any accumulated solvent vapors.

6. If a cleaning compound spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguishers to fight the fire.

NOTE: When fighting a cleaning compound fire, wear an oxygen breathing apparatus (OBA) or self contained breathing apparatus (SCBA).

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, containers and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Label used/excess cleaning compound and store as flammable used/excess materials in approved containers, pending proper shore disposal. (Note: Not all cleaning compounds are flammable, only those compounds determined to be flammable should be labeled as such. The MSDS should give some indication of the flammability of the used / excess cleaning compound). Consult your HAZMINCEN for guidance.

GROUP 5: COMPRESSED GASES

The compressed gases category includes acetylene, ammonia, argon, carbon dioxide, chlorine, chlorofluorinated hydrocarbons (e.g., R12), hydrogen, helium, nitrogen, oxygen, and propane. These gases are stored in heavy-walled metal cylinders, and they may exist in various ship's systems and piping. Compressed gases can also be found in aerosol containers containing HM and personal use products. Common propellants used in aerosol cans are liquid petroleum gases, e.g., propane, butane, and isobutane.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job involving compressed gases.

RISK ASSESSMENT

- Proper, careful management of compressed gas cylinders is important to risk management – protect valves, properly label, and mark empty cylinders.
- Leaking cylinders can render a storage area or use area unsafe.
- Horseplay with helium or any gases can kill.
- Most mishaps occur during cylinder movement, especially up and down ladders. It is not the gas that is as hazardous as the container – always have at least 2 people moving heavy cylinders.

COMPATIBILITY INFORMATION

GROUP 5 compressed gases are incompatible with heat sources, but rarely come into contact with other HM.

CONTROL MEASURES:

1. Ensure that supply and exhaust ventilation exists in compartments where compressed gases are stored or are in use.

2. Ensure Emergency Escaping Breathing Devices (EEBDs) are available for emergency escape when working with compressed gas below decks.

3. Compressed gases have many uses. Unique PPE is required based on the process in which the gas is used. For example:
   a. Welding
   b. Fire-fighting
   c. Clearing pipe and lines
   d. Treating wastes, treating metals
   e. Calibrating and pressurizing instruments
   f. Heating and cooling equipment
   g. Filling aviation oxygen cylinders

4. Wear impact resistant goggles when working with compressed gases.

5. Wear the appropriate cold resistant gloves when the hands may come in contact with compressed gases.

NOTE: Additional safety precautions and guidance for using compressed gases are specified in Chapter C23, paragraph C2311 or Chapter D15, paragraph D1510 of the NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), and NSTM Chapter 550 "Industrial Gases Generating, Handling, and Storage".

PRECAUTIONS: (Compressed Gases)

1. Ensure adequate supply and exhaust ventilation is provided for the space where you are using compressed gases.

2. Compressed gases may or may not be flammable; regardless, all cylinders may explode in a fire.

3. Never subject compressed gas cylinders, either in storage or in service, to a temperature in excess of 130 degrees Fahrenheit. A direct flame should never come in contact with the cylinder. Cylinders may explode in a fire.

4. Never drop cylinders nor permit them to strike against one another violently. Protect cylinders from objects that will cut or otherwise abrade the cylinder's surface metal.

5. DO NOT lift the cylinders using lifting magnets or slings.

6. DO NOT lift gas cylinders by the valve protection caps.

7. Only refill a cylinder when such action is approved by the command.

8. Fill the cylinder only with the gas for which the cylinder has been specifically designated and marked. Cylinders are color coded for the contents - do not paint cylinders.

9. Never use the cylinders for rollers, supports, or for any purpose other than to contain a gas.

10. Never tamper with the safety devices on cylinder valves or the cylinder.

11. Use only approved wrenches/tools for opening the cylinder valve. Never hammer or strike the valve wheel in attempting to open or close the valve.

12. Store a particular compressed gas only at its designated cylinder storage area (for example, the supply department gas cylinder storeroom, cargo storeroom, gas weather deck stowage, etc.) (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Chapters C-23 or D-15 for specific storage requirements.)

13. Ensure that gas cylinder storerooms are well ventilated, shielded from direct sunlight, and maintained at a temperature below 130 degrees Fahrenheit.

14. Make sure that each individual cylinder is securely fastened in the vertical position (valve end up) by metal collars, or by chains if in portable/in-use carts. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Chapters C-23 or D-15.)

15. Empty cylinders shall be tagged "EMPTY" or marked "MT" and segregated from full or partially full cylinders.

16. Store aerosol items in the flammable liquids storeroom. See NAVOSH Afloat Manual (OPNAVINST 5100.19D) Chapters C-23 and D-15 for specific storage requirements.

HEALTH HAZARDS:

1. Compressed gases may cause difficulty in breathing or suffocation by displacing the oxygen in the air.

If experiencing dizziness or difficulty in breathing (choking or coughing) while working with compressed gases, secure the compressed gas, and immediately move to an area with fresh air. Notify a supervisor.

If someone is overcome by breathing a compressed gas, immediately don an EEBD and/or evacuate the area. Sound the alarm and send for medical help. Do not enter or attempt rescue without a SCBA. (NOTE: Wear a self contained breathing apparatus (SCBA) or a pressure-demand supplied-air respirator with a minimum 15 minute auxiliary air supply if entering a confined space. Ensure that standby personnel are present with a suitable respirator per confined space entry/gas free engineering procedures. Perform CPR and give oxygen under the direct supervision of qualified medical personnel, if necessary.

2. Escaping compressed gases may be extremely cold and can cause frostbite when they come in contact with the skin.

If frostbite occurs because of contact with cold escaping gases, remove contaminated clothing and flush the skin with warm water, preferably in an agitated water bath. DO NOT RUB! Obtain medical attention immediately.

3. Ammonia, chlorine, and acetylene gases may be corrosive and can burn eyes and skin.

If the eyes or the skin become irritated while working with these gases, stop work and flush the eyes or the skin with water for at least 15 minutes. Obtain medical attention. Notify the supervisor.

SPILL CONTROLS:

1. Evacuate all unprotected persons and remove all sources of ignition such as flame, hot surfaces, and electrical, static, or frictional/grinding sparks.

2. Ensure that PPE such as gloves, goggles, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is a SCBA or a pressure-demand supplied air respirator with a minimum 15-minute auxiliary air supply. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Stop the leak/spill source if it can be done without risk.

4. Use water spray or fog to reduce gas vapors.

5. Remove leaking gas cylinders to outdoor locations and jettison. Then ventilate leak/spill areas with forced ventilation.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, containers and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Empty gas cylinders shall be tagged EMPTY, marked MT and segregated from full or partially full cylinders pending shore disposal or refill. Consult your HAZMINCEN for guidance.

GROUP 6: CORROSION PREVENTIVE COMPOUNDS

The corrosion preventive compounds group includes chemical conversion compounds and corrosion inhibitors.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Chemical conversion compounds and corrosion inhibitors are often misused as general cleaners.
- Proper preparation of metal surfaces is important to avoid misuse of corrosion inhibitors. Applying conversion compounds to loose rust can pose particulate / dust and chemical hazard to eyes when it is wire-brushed or disturbed.
- Most mishaps with corrosion inhibitors involve skin burns.

COMPATIBILITY INFORMATION

GROUP 6 corrosion preventive compounds are incompatible with Acids, Bases, Oxidizers, Ignition Sources (Groups 1, 3, and 18).

CONTROL MEASURES	PPE
1. Ensure that general ventilation (fixed or portable) is in operation in the vicinity of the area, when working with liquid corrosion preventive compounds. (CAUTION: Vapors may accumulate in low places). .	
2. When using aerosol-propelled corrosion preventive compounds in areas where there is no supply or exhaust ventilation, consult your Respiratory Protection Manager (RPM) to see if you need a respirator.	**RESPIRATOR** (situational)
3. Wear splash-proof chemical goggles at all times while using or pouring corrosion preventive compounds.	**EYE PROTECTION** (mandatory)
4. Use a face-shield in addition to the chemical goggles when pouring large quantities of liquid corrosion preventive compounds.	**FACE PROTECTION** (situational)
5. Wear rubber gloves when handling corrosion preventive compounds.	**HAND PROTECTION** (mandatory)

PRECAUTIONS: (Corrosion Preventive Compounds)

1. Avoid skin/eye contact with corrosion preventive compounds.

2. Avoid prolonged inhalation of the vapor/dust of corrosion preventive compounds.

3. If using corrosion preventive compounds from aerosol cans, make sure that the nozzle arrow is pointed away from the face.

4. Keep corrosion preventive compounds in closed containers and segregated from bases, oxidizers, and open flames.

5. Use corrosion preventive compounds in areas free from sources of ignition, such as sparks, open flames, and heat.

6. Store corrosion preventive compounds as flammable/combustible materials.

7. The components in corrosion preventive compounds may be toxic. Exercise good personal hygiene. Wash hands with soap and water prior to eating, smoking, drinking, or applying cosmetics.

HEALTH HAZARDS:

1. Prolonged, repeated skin contact with corrosion preventive compounds can result in a skin rash or a dry skin condition.

If corrosion preventive compounds contact the skin, wash the affected areas thoroughly with soap and water before work breaks and at the end of the job or work shift.

2. Exposure to the vapors of corrosion preventive compounds can irritate the eyes, nose, throat, or lungs.

If your eyes are itchy or watery, if you experience dizziness, or if you develop irritation in the nose, throat, or lungs while using corrosion preventive compounds, stop work and go to an area with fresh air. Obtain medical assistance.

3. Eye contact with corrosion preventive compounds can cause discomfort or even loss of vision.

If corrosion preventive compounds contact the eyes, stop work and immediately go to the nearest emergency eyewash. Flush the eyes including under the eyelids for at least 15 minutes. Obtain medical attention immediately, even if the injury does not seem to be severe.

4. Ingestion of corrosion preventive compounds can damage the digestive tract.

If a corrosion preventive compound is accidentally swallowed, call for medical assistance right away. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the area of the spill. Remove all sources of ignition such as open flames, hot surfaces, electrical static, or frictional/grinding sparks.

2. Stop the leak or spill source if it can be done without risk.

3. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves, splash-proof chemical goggles, and a respirator. Use a supplied-air respirator if the spill is in confined spaces if the concentration is unknown. Ask your supervisor, the DCA or the Safety Officer for additional PPE requirements.

4. Collect the spilled corrosion preventive compounds into approved containers using pumps or inert absorbents, and label the containers with their contents. Store as used/excess materials. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D) Appendix C23-A, or NSTM Chapter 593, Appendix A and Appendix B for approved containers.) (Note: Not all corrosion preventive compounds contain flammable materials. The MSDS will provide specific information about the flammability of the compound.)

5. Clean/wash spill areas with suitable hydrocarbon solvents such as mineral spirits or acetone and ventilate areas well to release solvent vapors. (NOTE: Ensure that precautions for solvents are followed.)

6. If a corrosion preventive compound spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, fog, or dry chemical extinguishers to fight fires.

NOTE: When fighting the fire, wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA).

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Store and label used/excess corrosion preventive compound in approved covered drums/containers, store as used/excess flammable material pending shore disposal. (Note: Not all corrosion preventive compounds contain flammable materials. Only those corrosion preventive compounds that contain flammable materials should be listed as such. The MSDS should provide specific information about the flammability of the compound.)

4. Depending on the specific contaminant, water contaminated with corrosion preventive compounds can possibly be discharged overboard. Consult your HAZMINCEN for guidance.

5. DO NOT incinerate aerosol cans. The puncturing of aerosol cans is only to be performed using a NAVSEA-approved puncturing device.

GROUP 7: DETERGENTS/SOAPS

The detergent/soap group includes laundry detergents, disinfectants, general purpose detergents, and scouring powders. Toilet and hand soaps, although members of this group, are not considered for control measures due to their low hazard. Many detergents and soaps contain high pH chemicals such as sodium hydroxide, trisodium phosphate or potassium hydroxide. These materials should be handled similarly to alkali/bases/caustics (See Group 3).

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards of this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Detergents and soaps are used daily at home and at work. Because they are so common, many users do not take the hazards seriously, leading to mishaps and exposures.
- Highly concentrated detergents are required to be diluted with water. Using them at full strength greatly increases the risk of injury.
- Most mishaps from detergents and soaps result from a lack of eye and hand protection.
- A cleaner in an unlabeled or incorrectly labeled container is a “booby trap” for shipmates.
- Although some detergents and soaps have a low toxicity, because their use is a condition of employment, the Navy is responsible for their safe use and warning sailors of any hazards

COMPATIBILITY INFORMATION

GROUP 7 detergents and soaps are incompatible with acids, cleaning compounds, and compressed gases (Groups 1, 4, and 5.)

CONTROL MEASURES	PPE
1. Ensure that general ventilation (fixed or portable) is in operation in the vicinity of the area where chlorine- or ammonia-based detergents are being used.	
2. If using ammonia-based detergents in areas where exhaust ventilation cannot be provided, see your Respiratory Protection Manager (RPM) about any requirement for a respirator.	**RESPIRATORS** (situational)
3. When working with large quantities of high pH powdered detergents or soap, and when in a situation where dust may be inhaled, see your Respiratory Protection Manager (RPM) about any requirement for a respirator.	
4. Wear rubber gloves to minimize skin contact with a detergent/soap which is not intended for use with skin.	**HAND PROTECTION** (situational)

5. Wear splash-proof goggles when liquid or powdered detergent/soap may strike the eyes, for example, pouring, scrubbing, or spraying with liquid detergent/soap.

EYE PROTECTION
(mandatory)

PRECAUTIONS: (Detergent/soap)

1. Avoid skin contact with detergents/soaps containing sodium hydroxide, trisodium phosphate, potassium hydroxide, or other high pH chemicals.

2. Avoid getting detergent/soap into the eyes.

3. Avoid breathing vapors or dust of detergent/soap. Keep containers closed when not in use.

4. Use detergent/soap only as prescribed on the container label. Do not combine different detergents/ soaps unless you are following specified by the manufacturer's instructions.
Make sure the correct amount and dilution is used.

5. When cleaning floor surfaces using a detergent/soap, exercise caution and post signs to warn others of a slippery floor.

6. DO NOT re-use empty detergent/soap containers for any purpose other than to hold used/excess detergent/soap.

7. Store detergent/soap in cool, dry areas.

HEALTH HAZARDS:

1. Prolonged, repeated skin contact with detergent/soap, which is not intended for the skin, may result in skin irritation and dryness.

If detergent/soap irritates the skin during use, stop using the detergent/soap and wash the affected skin areas thoroughly with large amounts of water. Report the incident to a supervisor.

2. Prolonged, repeated exposure to chlorine or ammonia-based detergent/soap vapors can irritate the eyes, nose, throat, or lungs.

If the eyes are itchy or watery, or if dizziness or irritation in the nose, throat, or lungs is experienced while using detergents/soaps, stop work and go to an area with fresh air. Report the condition to a supervisor.

3. Eye contact with detergent/soap can cause discomfort, or even loss of vision.

If a detergent/soap contacts the eyes, stop work and immediately go to the nearest emergency eyewash. Flush the eyes including under the eyelids for at least 15 minutes. Obtain medical attention immediately, even if the injury does not seem severe.

4. Ingestion of detergents/soaps can cause internal discomfort and irritation to the esophagus and the digestive tract.

If a detergent/soap is accidentally swallowed, call for medical help right away. If drinking water is available, rinse mouth immediately with one glass of water. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the vicinity of the spill.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. If the spill is in a confined space, have the Gas Free Engineer ensure the space is safe for entry.

4. Stop the leak or spill source if it can be done without risk.

5. Collect the spilled detergents/soaps into approved containers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

6. Flush spill areas with large amounts of water. Following flushing, make sure that spill areas are not slippery.

7. If a spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, fog, or dry chemical extinguishers to fight the fires.

NOTE: Use an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA when fighting a fire.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during the performance of PMS.

3. Containerize detergent/soap spills or used/excess material for shore disposal.

4. Spent detergents/soaps may be discharged into an approved sanitary system. Consult your HAZMINCEN for guidance.

GROUP 8: GREASES

The grease group includes graphite greases, silicone greases, molybdenum disulfide greases, plug valve greases, ball and roller bearing grease, and general purpose greases.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Although most greases have a low toxicity, they can still irritate the eyes and skin.
- Grease soaked rags are subject to spontaneous combustion if not properly stored and disposed of ashore – turn them in to the HAZMINCEN.
- Some grease contains heavy metals, such as lead, that are toxic – good personal hygiene and washing of hands before eating, smoking, and drinking are essential.

COMPATIBILITY INFORMATION

GROUP 8 greases are incompatible with Alkalis/Bases/Caustics and Oxidizers (Groups 3 and 18.)

CONTROL MEASURES	PPE
1. Local exhaust ventilation and respiratory protection are not normally required when using grease. If you become dizzy or disoriented, notify your supervisor and / or safety officer.	
2. Hand contact with most greases does not present a health problem; however, the use of protective gloves is recommended to prevent prolonged, repeated skin contact with greases. Wash hands with soap and water upon completion of work, especially if gloves are not worn.	**HAND PROTECTION** (situational)
3. Wear splash-proof chemical goggles as minimum eye protection when applying greases to overhead areas or when using grease under pressure in a gun.	**EYE PROTECTION** (situational)

PRECAUTIONS: (Greases)

1. Minimize/avoid repeated and prolonged skin contact with greases.

2. Avoid eye contact with greases.

3. Avoid breathing grease vapors, particularly when grease is applied to hot surfaces.

4. Do not expose greases to excessive heat or an open flame.

5. Exercise caution for slippery hand grip when gloves, tools, or machine parts have come in contact with greases.

6. Keep greases from contacting strong oxidizers such as calcium hypochlorite, chlorine laundry bleach, or peroxides.

7. Keep grease containers closed when not in use.

8. Properly label grease guns with content and MIL SPEC (usually done by HAZMINCEN when issued).

9. Store greases as flammable/combustible materials. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-C and D15-E for shipboard storage compartments.)

10. Protect grease containers from physical damage.

HEALTH HAZARDS:

1. Prolonged, repeated skin contact with greases can cause skin irritation in some individuals.

If grease contacts the skin, wash with soap/water upon completion of the job. Do not use solvents to remove grease from skin.

If grease is injected under the skin (possible from a grease gun under high pressure), obtain medical attention immediately.

2. Contact with grease in the eyes can result in irritation and discomfort.

If grease gets in the eyes, stop work, proceed to the nearest emergency eyewash and immediately flush eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

3. Grease vapors usually are not a problem unless on a heated surface.

However, if you become dizzy/disoriented while working with greases, stop work and proceed to an area with fresh air. Consult your supervisor. Seek medical attention if necessary.

4. Ingestion of greases can cause internal discomfort and can damage internal organs (LEAD POISONING is possible for greases containing lead). Ingestion may also cause a laxative condition or diarrhea.

If a grease is accidentally swallowed, call for medical assistance right away. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Wear rubber gloves and splash-proof chemical goggles before attempting any spill control actions.

2. Secure all sources of fire and flame in the vicinity.

3. Scoop the spilled grease into approved containers, original can, or doubled plastic bags. Seal and label container or bag as to the contents. Store as used hazardous flammable material pending shore disposal.

4. Wash the spilled areas with general purpose detergent and water to reduce slip hazards.

5. If a grease spill involves a fire, report the fire in accordance with established procedures. Use carbon dioxide or dry chemical extinguishers to fight the fires. NOTE: DO NOT use water to fight grease fires. Use an oxygen breathing apparatus (OBA) or a self-contained breathing apparatus (SCBA) while fighting a grease fire.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize spent greases or spilled greases in an approved container, original can, or doubled plastic bags. Seal and label container or bag as to the contents and store as used hazardous flammable material pending shore disposal. No overboard discharges are permitted. Consult your HAZMINCEN for guidance.

4. Never place used or excess grease in shipboard incinerators.

GROUP 9: HYDRAULIC FLUIDS

The hydraulic fluid group includes petroleum-based fluids, synthetic fire-resistant fluids, and water-based fire resistant fluids.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Most eye and skin injuries occur during maintenance and spill clean-up. Hydraulic fluids can be absorbed through the skin.
- Fluid-soaked PPE must be laundered separately from other clothing or discarded. Do not place PPE back in storage lockers without proper decontamination.
- Absorbents should be used to soak up spillage so that it does not become an exposure or slip hazard.
- High pressure leaks can be a fire hazard. Inhalation of hydraulic fluid mist can damage lungs.

COMPATIBILITY INFORMATION

GROUP 9 hydraulic fluids are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18.)

CONTROL MEASURES	PPE
1. Ensure that general ventilation (fixed or portable) is in operation in the vicinity of the area where hydraulic fluids are being used, loaded, drained, or vented. If local exhaust ventilation cannot be provided and the work may result in breathing hydraulic fluid vapors/mists, consult the Respiratory Protection Manager (RPM) about the need for a respirator. NOTE: SCBAs should be available for spill clean-up in elevator machinery rooms where the installed supplied air systems have been removed.	**RESPIRATORS** (situational)
2. If working with synthetic fire-resistant fluids or with water-based fire-resistant fluids in an area where the air is contaminated with a visible mist or spray from these hydraulic fluids, use a self contained breathing apparatus (SCBA) or a full-face pressure demand air-line respirator with a 15 minute auxiliary air supply.	
3. Wear splash-proof chemical goggles when hydraulic fluids may strike the eyes.	**EYE PROTECTION**

(For example, when breaking or examining a pipe joint containing hydraulic fluids or when venting a hydraulic system.) In general, since most systems are sealed, risks to the eyes only occur in the event of a spill or when opening the system.

(mandatory)

4. Use a faceshield in addition to the chemical goggles if splashing is expected. (For instance, pouring hydraulic fluids out of a 5-gallon container.)

FACE PROTECTION
(situational)

5. Wear protective gloves to prevent prolonged, repeated skin contact with hydraulic fluids. DO NOT use latex gloves.
   - Wear neoprene gloves for petroleum-based fluids.
   - Wear butyl rubber gloves for synthetic fire-resistant fluids and water-based fire resistant fluids.

HAND PROTECTION
(mandatory)

6. Wear a plastic apron over full work clothing as minimal body protection when working with hydraulic fluids.

BODY/SKIN PROTECTION
(situational)

7. Wear an oil/fuel splash suit or coveralls when performing jobs in which the body or clothing may come into contact with hydraulic fluid. (For example, when repairing a leaking hydraulic system where the surroundings are contaminated with visible hydraulic mist and spray.)

8. When handling large quantities of hydraulic fluids (greater than 5 gallons) and where shoes may come in contact with the hydraulic fluid, wear boot covers.

FOOT PROTECTION
(situational)

NOTE: Specific hydraulic fluid handling and spill kits must be available for ISOPAR and FYRQUEL hydraulic fluids. Components for ISOPAR are listed under Allowance Equipage List (AEL) C920014577.

PRECAUTIONS: (Hydraulic Fluids)

1. Avoid repeated and prolonged skin contact with hydraulic fluids.

2. Prevent hydraulic fluids from contacting the eyes.

3. Avoid breathing the vapors of hydraulic fluids.

4. Exercise caution for slippery hand grips when gloves, tools, or machine parts have come into contact with hydraulic fluids.

5. Store hydraulic fluids in designated flammable liquid storerooms, cabinets, or lockers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-C and D15-E for shipboard storage compartments.) Make sure containers are tightly closed.

6. Do not store hydraulic fluids near heat, ignition sources, or oxidizers such as calcium hypochlorite, sodium nitrate, or hydrogen peroxide.

HEALTH HAZARDS:

1. Prolonged or repeated skin contact with hydraulic fluids can cause skin irritation and possible drying of the skin.

If hydraulic fluids contact the skin, wash thoroughly with soap and water. Wash hands upon completion of any job involving hydraulic fluids, before breaks, and before eating, drinking, smoking or applying cosmetics.

2. Eye contact with hydraulic fluids can result in irritation and discomfort.

If hydraulic fluids contact the eyes, stop work, proceed to the nearest emergency eyewash, and immediately flush eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

3. Prolonged exposure to hydraulic fluid vapors or mists can cause dizziness, nausea, or irritation to the throat and lungs. Breathing vapor may depress the central nervous system; loss of coordination may occur.

If you feel dizzy or disoriented or if irritation in the throat or lungs occurs while using hydraulic fluids, stop work and proceed to an area with fresh air. Notify a supervisor of the incident. Seek medical attention if necessary.

4. Ingestion of hydraulic fluids can cause stomach pain and diarrhea condition. Kidney damage may be a long-term health effect.

If hydraulic fluids are accidentally swallowed, rinse the victim's mouth with water and get immediate medical assistance. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the spill area and remove all sources of ignition such as flames, hot surfaces, electrical, or frictional/grinding sparks.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves, splash-proof chemical goggles, and a half-mask air-purifying respirator equipped with organic vapor cartridges for concentrations below 10 times the occupational exposure limit. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Stop the leak/spill source if it can be done without risk.

4. Use pumps or absorbent materials to collect the spilled hydraulic fluids into an approved container pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Clean the spilled areas using a solvent such as mineral spirits (follow the precautions for the solvent). Then, wash areas with detergent and water to reduce slipping hazards.

6. If a hydraulic fluid spill involves a fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguishers to fight a hydraulic fluid fire.

NOTE: Wear an oxygen breathing apparatus (OBA) or a SCBA when fighting fires.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize spent or spilled hydraulic fluids in approved containers for proper shore disposal. Consult your HAZMINCEN for guidance.

4. Keep collected petroleum hydraulic fluids separate from synthetic hydraulic fluids.

GROUP 10: INSPECTION PENETRANTS

The inspection penetrant group includes fluoro-finder penetrants, water-indicating pastes, and penetrant removers.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Penetrants in aerosol cans must be stored as flammables.
- Aerosol penetrants pose an inhalation hazard.
- The ingredients in penetrants vary and those containing dyes may be toxic – always check labels and MSDSs.

COMPATIBILITY INFORMATION

GROUP 10 inspection penetrants are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18.)

CONTROL MEASURES	PPE
1. Ensure that general ventilation (fixed or portable) is in operation in the vicinity of the area where inspection penetrants are being used.	
2. When using aerosol-propelled inspection penetrants in an area where ventilation is inadequate, and where the solvent vapors may be breathed, consult your Respiratory Protection Manager (RPM) about the need for a respirator.	**RESPIRATOR** (situational)
3. Wear safety goggles to prevent eye injury when brushing or spraying inspection penetrants at eye level or over head.	**EYE PROTECTION** (situational)
4. If the hands may come in contact with inspection penetrants, use neoprene gloves to prevent repeated and prolonged skin contact.	**HAND PROTECTION** (situational)
5. When working with large quantities of inspection penetrants and where splashing is possible, wear a plastic apron.	**SKIN PROTECTION** (situational)
6. Use a face shield over the eye goggles to protect the face and neck in situations where splashing is possible or expected.	**FACE PROTECTION** (situational)

PRECAUTIONS: (Inspection penetrants)

1. Avoid repeated and prolonged skin contact with inspection penetrants.

2. Avoid eye contact with inspection penetrants.

3. Avoid breathing vapors and mists of inspection penetrants.

4. If using inspection penetrants from aerosol cans, ensure that the nozzle arrow is pointed away from your face.

5. Use inspection penetrants in areas free from sources of ignition such as sparks, open flames, and oxidizers such as calcium hypochlorite, sodium nitrate, and hydrogen peroxide.

6. Store inspection penetrants in designated flammable liquid storerooms, cabinets, or lockers (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-C and D15-E for shipboard storage compartments.) Ensure that containers are tightly closed.

7. Do not store aerosol inspection penetrants in areas with temperatures above 120 degrees Fahrenheit or in areas adjacent to steam lines or near hot equipment.

HEALTH HAZARDS:

1. Vapors from inspection penetrants (especially from aerosol containers) can irritate the nose, throat, or lungs.

If you experience light-headedness or irritation of the nose, throat, or lungs while using inspection penetrants, stop work and go to an area with fresh air. Report the incident to a supervisor.

2. Eye contact with the liquids or vapors of inspection penetrants can be irritating.

If inspection penetrants contact the eyes, stop work, proceed to the nearest emergency eyewash, and immediately flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

3. Prolonged or repeated skin contact with inspection penetrants may result in skin irritation and drying.

If inspection penetrants contact the skin or if the skin becomes red, dry, or irritated or cracks/blisters form from using inspection penetrants, wash affected areas with soap and water. Report conditions to a supervisor, and obtain medical attention.

4. Ingestion of inspection penetrants may result in stomach upset and vomiting.

If an inspection penetrant is accidentally ingested, get immediate medical assistance. DO NOT induce vomiting or give the victim anything to eat or drink unless directed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the spill area. Remove all sources of ignition such as open flames, hot surfaces, electrical, static, or frictional/grinding sparks.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is acid resistant gloves, splash-proof

chemical goggles, and a respirator. Ask your supervisor, the DCA, or the Safety Officer to identify any additional PPE requirements.

3. Ventilate spilled areas and stop or contain the leak/spill source if it can be done without risk.

4. Use a pump or absorbent materials to collect the spilled inspection penetrants into an approved container pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Wash spilled areas with detergent and water to reduce slipping hazards.

6. If an inspection penetrant spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguishers to fight the fire.

NOTE: Use an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) when fighting the fire.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during the performance of PMS.

3. Containerize used/excess inspection penetrants in approved, labeled, containers for proper shore disposal. Consult your HAZMINCEN for guidance.

4. DO NOT incinerate aerosol cans. The puncturing of aerosol cans is only to be performed using a NAVSEA approved puncturing device.

GROUP 11: LUBRICANTS/OILS

The lubricant/oil group includes general purpose oil, turbine lube oil, refrigerant oil, gear oil, vacuum pump oil, and weapon oil.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job. Consult the product's MSDS for additional guidance.

RISK ASSESSMENT

- Lubricants can contain hazardous ingredients that can be absorbed with prolonged skin contact, especially from contaminated clothing.
- Because lubricants are common use items and most have a relatively low toxicity, complacency can lead to mishaps.
- Lubricant-soaked rags can spontaneously combust if not properly stored or disposed of (turn in to HAZMINCEN).

COMPATIBILITY INFORMATION

GROUP 11 lubricants and oils are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18).

CONTROL MEASURES	PPE
1. Ensure that exhaust ventilation is in operation in the vicinity of the area where lubricants/oils are being used, sampled, filled, or drained. If exhaust ventilation cannot be provided and the work may result in breathing excessive lubricant/oil vapors/mists, consult your Respiratory Protection Manager (RPM) about the need for respiratory protection.	
2. When spraying aerosol lubricants/oils in areas with no exhaust ventilation, consult your Respiratory Protection Manager (RPM) about the need for respiratory protection.	**RESPIRATOR** (situational)
3. Wear splash-proof chemical goggles when using lubricants/oils. (mandatory)	**EYE PROTECTION**
4. Wear oil-proof neoprene/rubber gloves when the hands may come in contact with lubricants/oils.	**HAND PROTECTION** (mandatory)
5. Wear a splash suit or coveralls when working with large quantities of lubricants/oils or in a situation where the body may become contaminated with	**SKIN PROTECTION** (situational)

oils. (For example, cleaning a lube oil sump.)

PRECAUTIONS: (Lubricants/Oils)

1. Minimize/avoid repeated and prolonged skin contact with lubricants/oils.

2. Avoid splashing lubricants/oils into the eyes.

3. Avoid breathing lubricant / oil vapors / mists.

4. Use and store lubricants/oils in areas free from sources of ignition such as sparks, open flames, and oxidizers such as calcium hypochlorite, sodium nitrate, and hydrogen peroxide.

5. If using lubricants/oils from aerosol cans, ensure that the nozzle arrow is pointed away from the face.

6. Exercise caution for slippery hand grips when gloves, tools, or machine parts have come into contact with lubricants/oils.

7. Store lubricants/oils in designated flammable liquid storerooms, cabinets, or lockers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-C and D15-E for shipboard storage compartments.) Ensure that containers are tightly closed.

8. Do not store lubricants in aerosol cans in areas with temperatures above 120 degrees Fahrenheit.

HEALTH HAZARDS:

1. Prolonged, repeated skin contact with oils/lubricants can cause skin irritation and possible drying of the skin. Long-term exposure to used motor oils/lubricants has been shown to cause skin cancer in mice. Good personal hygiene is essential.

If oils/lubricants contact the skin, wash with soap and water. Also wash hands at the end of the job, before breaks, and prior to eating, drinking, smoking, or applying cosmetics.

If the skin becomes red, dry, or irritated from using oils/lubricants, report the conditions to a supervisor. Get medical attention.

2. Eye contact with oils/lubricants can result in irritation and discomfort.

If oils/lubricants get into the eyes, stop work and proceed to the nearest eye-wash and flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

3. Prolonged exposure to oil vapors or mists can cause dizziness, nausea, or irritation to the nose, throat, and lungs. Pulmonary disease is a possible long term health effect.

If you feel dizzy or disoriented, or irritation in the throat or lungs occur while using oils/lubricants, stop work and proceed to an area with fresh air. Notify a supervisor of the incident. Seek medical attention if necessary.

4. Ingestion of oils/lubricants can cause internal discomfort and induce a laxative condition (diarrhea).

If an oil/lubricant is accidentally swallowed, rinse the victim's mouth and obtain medical assistance immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel and remove all sources of ignition such as open flames, hot surfaces, electrical, static, or frictional/grinding sparks.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Stop and contain the leak or spill source if it can be done without risk.

4. Use a pump or absorbent materials to collect the spilled oils/lubricants into an approved covered drum pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Clean the spilled areas using a general purpose detergent and water to reduce hazards from slipping.

6. If an oil/lubricant spill involves fire, report the fire in accordance with established procedures. Use Aqueous Film Forming Foam (AFFF), carbon dioxide, water fog (when AFFF not available), or dry chemical extinguishers to fight fires.

NOTE: DO NOT use solid stream water to fight oil/lubricant fires. Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) while fighting oil/lubricant fires.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station HAZMINCEN procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize spent or spilled oils/lubricants in approved containers for proper shore disposal. See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix or NSTM Chapter 593, Appendix A and Appendix B for approved containers. See also PMS Disposal Method 1 in Appendix E of this guide.

4. Keep collected petroleum lubricants/oils separate from synthetic lubricants/oils.

GROUP 12: PAINT MATERIALS

The paint material group includes paints, primers, thinners, enamels, lacquers, strippers, and varnishes.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of the PPE specified in the Control Measures section will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Most mishaps with painting materials involve splashes in the eyes and persons becoming overcome by vapors in spaces with poor ventilation.
- Hand cleaner should be available if the process will result in paint on the skin or in the hair.
- The Respiratory Protection Manager needs to know what type of paint, how much, and where painting will take place to properly select the respirator for the job.

COMPATIBILITY INFORMATION

GROUP 12 paints are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18.)

CONTROL MEASURES	PPE
1. Below decks, ensure that local exhaust ventilation (fixed or portable) is in operation in the vicinity of the area where paint materials are being used or cured (being dried).	
2. Full face-piece continuous-flow air-line respirators are normally required for an interior spray painting job – consult your Respiratory Protection Manager (RPM) for respirator requirements.	**RESPIRATOR** (situational)
3. When using aerosol-propelled paints and other oil based paints in areas with poor ventilation, consult your Respiratory Protection Manager (RPM) for respirator requirements.	
4. Wear gloves to prevent prolonged, repeated contact with paint materials: - Any type of protective gloves can be used with water-based paint. (Cotton gloves can only be used for water-based paints.) - Use neoprene gloves for all other paint materials.	**HAND PROTECTION** (situational)
5. Wear splash-proof chemical goggles at all times while using paint materials (mixing, brushing, rolling, or	**EYE PROTECTION** (mandatory)

spraying). A full-length faceshield may also be required when engaged in spraying operations.

6. Use a face shield in addition to eye goggles when pouring or mixing paint materials such as paint strippers or thinners.

FACE PROTECTION
(situational)

7. Wear utility coveralls and keep the sleeves rolled down when painting.

SKIN/BODY PROTECTION
(situational)

8. Wear a head covering when painting above waist level (in most instances, a utility cap is sufficient). The use of a head-hood is required when spray-gun painting. Ensure the head covering does not interfere with the sealing surface of the respirator.

9. Use a protective skin cream on exposed parts of the skin when using paint materials containing sensitizers (examples vinyl, vinyl-alkyd, polyurethane, epoxy, or alkyd paints).

PRECAUTIONS: (Paint Materials)

1. Read the container label for safety information before you start the job.

2. Ensure exhaust and supply ventilation exists in and around the painting vicinity.

3. Avoid repeated and prolonged skin contact with paint materials.

4. Use soap and water to remove paint from skin. NEVER use solvents such as paint thinner or kerosene to clean paints from the skin.

5. Avoid splashing paint materials into the eyes.

6. Avoid breathing the vapors / aerosols of paint materials (especially when spraying paint materials).

7. Use paint materials in areas free from sources of heat and ignition.

8. If using paint material from aerosol cans, make sure that the nozzle arrow is pointed away from the face.

9. Keep paint containers closed when not in use.

10. Return paint materials to the HAZMINCEN, flammable liquid storage cabinet, paint locker, or flammable liquid storeroom upon completion of the day's work. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix for shipboard storage compartments.)

11. Keep paint materials away from acids and strong oxidizing agents.

12. Wash hands with soap and water after painting and prior to eating, drinking, smoking, chewing, or applying cosmetics.

HEALTH HAZARDS:

1. Paint materials frequently contain dangerous classes of chemicals. Among these dangerous chemicals are solvents, cancer causing agents, and sensitizers or allergens. Read the paint material's container for warnings of dangerous ingredients before using.

Potential human carcinogens commonly found in paints include lead chromate, zinc chromate, strontium chromate, cadmium pigments, and epichlorohydrin.

Common chemicals that cause allergic reactions or sensitization are isocyanates (found in polyurethane paints), diethyl triamine (found in epoxy paints), peroxides, and some metals.

2. Paint material vapors can irritate the nose, throat, or lungs. Long-term exposure to paint vapors can cause liver, kidney, lung, and brain damage. Poor coordination and loss of consciousness may result from breathing excessive paint vapor.

If experiencing light-headedness or coughing or irritation in the nose, throat, or lungs while using paint materials, stop work and go to an area with fresh air. Obtain medical attention immediately.

If a worker is overcome by breathing paint vapors, get the person to fresh air immediately. Give artificial respiration if breathing has stopped. Obtain medical attention immediately.

3. Direct skin exposure to paint materials can result in drying of the skin which may lead to dermatitis, a skin disease.

If paint materials contact the skin or if the skin gets red, dry, irritated, or forms cracks/blisters from using paint materials, wash the affected areas with soap and water. Report the conditions to a supervisor and get medical attention.

4. Eye contact with paint materials can result in discomfort and irritation.

If paint materials contact the eyes, stop work, proceed to the nearest eye wash station, and immediately flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

5. Some paint materials are poisons when ingested.

If a paint material is accidentally swallowed, call for medical assistance immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the spill area. Remove all sources of ignition such as open flames, hot surfaces, or electrical, static, or frictional/grinding sparks.

2. Ensure that PPE such as goggles, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Ventilate the spill area and stop or contain the leak/spill source if it can be done without risk.

4. Use absorbents or rags to collect the spilled paint materials into the original can or an approved container pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST

5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Clean spilled areas using paint thinners or suitable hydrocarbon solvents such as mineral spirits, taking the appropriate precautions when using solvents. Avoid breathing the solvent vapors. Use an organic vapor respirator. Use water to clean up latex paint.

6. If a paint spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguisher to fight the fire.

NOTE: Use an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) for fighting fires.

DISPOSAL GUIDELINES:

1. Containerize excess paints in the original container and turn in to the HAZMINCEN for proper shore disposal.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize all used/excess paint materials in approved containers for proper shore disposal. Consult your HAZMINCEN for guidance.

13: PHOTOGRAPHIC CHEMICALS

The photographic chemical group includes color and black and white developers, fixers, bleaches/stopbath, replenishers, x-ray developers and toners.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of the PPE specified in the Control Measures section will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Mixing photographic chemicals and filling tanks can pose splash hazards to the eyes. Since some developers may contain acid, splashes in the eyes can cause intense pain and disorientation. Personnel should not work alone.
- Color photography chemicals are usually more toxic than those used for black and white developing, so reading the label and MSDS is especially important.
- Most developers are formulas of dilute acids and bleaches, and can give off gases if incorrectly mixed.
- Potable water hoses left in chemical trays can draw water back into the potable water system. These systems must be equipped with a backflow preventer.

COMPATIBILITY INFORMATION

GROUP 13 photo chemicals are incompatible with Acids and Heavy Metals (Groups 1 and 20).

CONTROL MEASURES	PPE
1. Ensure that exhaust ventilation is in operation in areas where photographic chemicals are being used (for instance, in print shops, darkrooms and all chemical mixing areas). Respirators are rarely required, but ask your Safety Officer to have your process evaluated.	
2. When working with photographic chemicals, whether using tongs or mixing with stirrers, wear rubber gloves if hand contact with chemicals is possible.	**HAND PROTECTION** (situational)
3. Wear splash-proof chemical goggles when mixing photographic chemicals or when in situations where photographic chemicals may strike the eyes. A full-length faceshield may also be required, in addition to goggles, for operations where splashing of the material can occur.	**EYE PROTECTION** (mandatory)
4. When mixing or pouring photographic chemicals, wear a plastic apron over work clothing.	**SKIN / BODY** (mandatory)

When working with photographic color chemicals, wear a long-sleeved shirt with the shirt sleeves rolled down.

PRECAUTIONS: (Photographic chemicals)

1. Read the container labels for safety information before you start mixing any photographic chemicals.

2. Avoid repeated and prolonged skin contact with photographic chemicals. Use print tongs, clips, and stirring rods instead of fingers when handling films and paper in solutions.

3. Avoid splashing photographic chemicals into the eyes.

4. Avoid purposely breathing vapors or dust of photographic chemicals (especially when mixing photographic chemicals using warm or hot water).

5. Use a hand cleaner to help minimize the possibility of allergic skin reaction when using photographic chemicals. Wash your hands after using photographic chemicals and before eating, drinking, smoking, chewing, or applying cosmetics.

6. Store usable photographic chemicals in approved plastic containers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for listings of approved containers.)

7. Store photographic chemicals in cool, dry areas (provide separate storage areas for photographic chemicals which react violently with each other).

HEALTH HAZARDS:

1. Photographic chemicals can cause skin irritation or painful chemical burns to affected areas.

If photographic chemicals get on the skin, immediately wash the affected areas with soap and water.

If the skin becomes irritated during or after using a photographic chemical, report the condition to your supervisor and obtain medical attention.

2. Gases from photographic chemicals can irritate the nose, throat, or lungs.

If experiencing light-headedness, difficulty in breathing, or coughing due to irritation in the nose, throat, or lungs while using photographic chemicals, stop work and go to an area with fresh air. Report the incident to a supervisor. Seek medical attention if necessary.

3. Photographic chemicals are poisons when ingested.

If a photographic chemical is accidentally swallowed, rinse the victim's mouth and obtain medical attention immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

4. Contact of photographic chemicals with the eyes can cause discomfort and irritation.

If photographic chemicals get in the eyes, stop work and proceed to the nearest eye wash station. Flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the spill area. Remove all sources of ignition such as flame, static electricity, or frictional/grinding sparks.

2. Ensure that PPE such as goggles, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Ventilate the spill area. Stop or contain the spill source if it can be done without risk.

4. Use a pump or absorbent to collect spilled photographic chemicals (liquid or solid) into an approved container pending shore disposal.

5. Clean spill areas using detergent and water.

6. If a photographic chemical spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguishers to fight a photographic chemical fire.

NOTE: Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) when fighting fires.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize excess/used photographic chemicals and used/excess film processing materials for shore disposal. Overboard discharges are permitted in some cases. Consult your HAZMINCEN for guidance.

GROUP 14: POLISH/WAX COMPOUNDS

The polish/wax compound group includes buffing compounds, metal polishes, automobile waxes, and general purpose waxes.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Brass polish (Brasso and Never-Dull) are flammable and cannot be used around sources of heat.
- Aerosol metal polishes give off solvent vapors and can be hazardous if inhaled.

COMPATIBILITY INFORMATION

GROUP 14 polishes and wax compounds are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18).

CONTROL MEASURES	PPE
1. Local exhaust ventilation and respiratory protection are not normally required for using most polishes or waxes. If in doubt, or if the vapors cause dizziness or a headache, consult your Respiratory Protection Manager.	
2. Hand contact with most polishes/waxes does not present a health problem; however, the use of protective gloves is recommended to prevent skin damage from prolonged, repeated skin contact with polishes/waxes. Wash the hands with soap and water upon completion of the work or before eating, drinking, smoking, or applying cosmetics, especially if gloves are not worn.	**HAND PROTECTION** (situational)
3. Use splash-proof chemical goggles to prevent liquid or aerosol polishes/ waxes from getting into the eyes.	**EYE PROTECTION** (situational)

PRECAUTIONS: (Polish/wax compounds)

1. Avoid repeated and prolonged skin contact with polish/wax compounds.
2. Avoid purposely breathing solvent vapors from polish/wax compounds.

3. Use polish/wax compounds in areas free from sources of heat and ignition.

4. Store polish/wax compounds as combustible materials. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D) Appendix C-23C, for shipboard storage compartments.)

5. Keep polish/wax compounds away from heat, open flames, and oxidizing materials.

HEALTH HAZARDS:

1. Prolonged, repeated skin contact with polish/wax compounds can irritate and cause dry skin or soften the skin. Hot wax can burn skin when it is used as a hot melt.

If polish/wax compounds contact the skin, wash the affected areas with soap and water upon completion of the job.

If hot wax strikes the skin, immerse the burned skin in cold water. DO NOT try to remove wax from the burn until after it has cooled. Obtain medical attention immediately.

2. Breathing the solvent vapors from polish/wax compounds can cause headache, dizziness, or loss of consciousness.

If experiencing light-headedness or coughing due to irritation in the nose, throat, or lungs while using polish/wax compounds, stop work and go to an area with fresh air. Report the incident to a supervisor. Seek medical attention if necessary.

3. Eye contact with polish/wax compounds can result in discomfort and irritation.

If polish/wax compounds contact the eyes, stop work, proceed to the nearest eye wash station, and flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

4. Ingestion of polish/wax compounds may result in a laxative condition (diarrhea).

If a polish or wax is accidentally swallowed, obtain medical attention immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person

SPILL CONTROLS:

1. Wear rubber gloves and splash-proof chemical goggles before attempting spill controls.

2. Ventilate the spill area. Stop or contain the leak or spill source.

3. Collect spilled polish/wax compounds into an approved container pending shore disposal. If a spilled wax is hot, allow wax to cool then remove as used/excess solid material for proper shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-A or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

4. Clean spilled areas using suitable hydrocarbon solvents such as an alcohol (take appropriate precautions for the solvent).

5. If a solvent spill involves a fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguishers to fight the fire.

NOTE: DO NOT use water to fight fires involving waterproof wax. Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) when fighting fires.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize used/excess polish/wax in an empty original container pending shore disposal. Consult your HAZMINCEN for guidance.

GROUP 15: SOLVENTS

The solvents group includes hydrocarbon solvents such as acetone, methyl ethyl ketone, toluene, xylene, ISOPAR-M, and alcohols. The solvents group also includes mixed solutions such as anti-freeze, heat transfer fluid, turpentine, dope, and naphtha thinner.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of the PPE specified in the Control Measures section will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Solvents are the second greatest source of chemical mishaps, second only to general purpose cleaners. Frequency of use leads to complacency. Eye and skin irritation are common hazards.
- Nearly all solvents are highly flammable.
- Solvents must be strictly controlled to prevent release to the environment.

COMPATIBILITY INFORMATION

GROUP 15 solvents are incompatible with Corrosives, Oxidizers, and Batteries (Groups 1, 3, 18, and 21).

CONTROL MEASURES	PPE
1. Ensure that local exhaust ventilation (fixed or portable) is in operation in the vicinity of the area where solvents are being used.	
2. If local exhaust ventilation cannot be provided and the work could result in breathing solvent vapors, consult your Respiratory Protection Manager about the need for a respirator. If there is concern regarding the oxygen level or the presence of flammable or explosive vapors, have the Gas-Free Engineer check the space.	**RESPIRATOR** (situational)
3. Wear splash/vapor-proof chemical goggles at all times while working with solvents. If working on the flight deck with solvents, wear the approved flight deck goggles.	**EYE PROTECTION** (mandatory)
4. If there is potential for the hands to come into contact with solvents, wear neoprene or nitrile rubber gloves to prevent prolonged, repeated skin contact.	**HAND PROTECTION** (mandatory)
5. Use a face-shield over the eye goggles to protect the face and neck in	**FACE PROTECTION**

situation where solvent splashing is possible or expected (for instance, when pouring solvents).	(situational)
6. Wear a chemical protective suit or coveralls when working with large quantities of solvents and splashing of solvents is possible or expected.	**SKIN/BODY PROTECTION** (situational)

PRECAUTIONS: (Solvents)

1. Avoid repeated and prolonged skin contact with solvents.

2. Avoid splashing solvents into the eyes.

3. Avoid breathing solvent vapors.

4. Keep solvent containers closed when not in use.

5. Use the particular solvent only for its intended purpose; DO NOT use any solvent for unauthorized applications.

6. DO NOT use solvents on hot surfaces unless specifically directed.

7. If using a solvent in an aerosol can, make sure that the nozzle arrow is pointed away from your face.

8. Use or store solvents in areas free from sources of ignition, spark, open flames, and oxidizers such as calcium hypochlorite, sodium nitrate, and hydrogen peroxide.

9. Store solvents in designated flammable liquid storerooms, cabinets, or lockers. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-C and D15-E for shipboard storage compartments.) Make sure containers are tightly closed.

10. Do not store aerosol solvents in areas where temperatures may exceed 120 degrees Fahrenheit.

HEALTH HAZARDS:

1. Solvent vapors can irritate the nose, throat, or lungs. Some solvents may displace breathing air. Long-term health effects may cause liver, kidney, lung, eye, and brain damage.

If experiencing light-headedness, difficulty in breathing, or coughing due to irritation in the nose, throat, or lungs while using solvents, stop work and go to an area with fresh air. Report the incident to a supervisor. Seek medical attention if necessary.

If a worker is overcome by breathing solvent vapor, get the person to fresh air immediately (CAUTION - don proper respirator (SCBA) prior to rescue). Give artificial respiration if breathing has stopped. Obtain medical attention immediately for the injured person.

2. Direct skin exposure to solvents can result in drying of the skin which may lead to dermatitis, a skin disease. Solvents can enter your body even if they contact only a small area of skin.

If solvents contact the skin, wash the affected areas with soap and water.

If the skin gets red, dry, or irritated or forms cracks/blisters from using solvents, wash affected areas with soap and water. Report the condition to your supervisor and get medical attention.

3. Eye contact with solvents can cause discomfort, irritation or eye damage.

If solvents contact the eyes, stop work, proceed to the nearest emergency eyewash, and immediately flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

4. Ingestion of solvents can damage the vital organs and the central nervous system. Ingestion of methyl alcohol can damage optic nerves and may result in blindness.

If a solvent is accidentally swallowed, call for medical assistance immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

5. Organic solvents, at any level of exposure, may be associated with problems during pregnancy.

Pregnant workers should consult with their treating physician(s) prior to working with any solvent.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the affected spaces. Remove all sources of ignition such as open flames, hot surfaces, and electrical, static, or frictional/grinding sparks.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves, splash-proof chemical goggles, and an organic vapor respirator for concentrations up to 10 times the occupational exposure limit. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Ventilate spill areas. Stop or contain the leak/spill source if it can be done without risk.

4. Use a pump or absorbent materials to collect the spilled solvents into an approved container pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D) Appendix C-23A, or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Clean solvent-spilled areas using detergents and water.

6. If a solvent spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide, water fog, or dry chemical extinguisher to fight the fire.

NOTE: Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) for fighting fires.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize all other used/excess solvents in approved containers for proper shore disposal. Consult your HAZMINCEN for guidance.

GROUP 16: THERMAL INSULATION

The thermal insulation category includes asbestos and non-asbestos materials such as pipe lagging, boiler insulations, packing materials, and floor/ceiling tiles. The number one concern is the breathing of asbestos fibers, ceramic fibers, fibrous glass, and mineral wool fibers. Breathing excessive concentrations of asbestos fibers or man-made vitreous fibers can cause lung diseases, and some of these materials have been implicated as potential lung carcinogens. These adverse health effects may not show up until many years after initial exposure. Asbestos may also present in break shoes and pads.

Safety guidance and personal protective equipment (PPE) suitable for the hazards in this category are given below as Control Measures. Proper use of the PPE (especially a respirator) specified in the Control Measures section will provide the necessary protection against long-term health effects.

Ask your supervisor or Safety Officer or contact an industrial hygienist for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job involving thermal insulation.

(NOTE: Other than IMA (tender or SIMA) repair personnel, asbestos removal by forces afloat is to be done only in an emergency by a trained assigned Emergency Asbestos Removal Team in accordance with OPNAVINST 5100.19D, Chapter B1.)

RISK ASSESSMENT

- Do not assume an insulation is asbestos-free – check the label and MSDS. There are still asbestos-containing items in the stock system, for which there are no substitutes.
- Fibers can irritate nasal passages and lungs – use amended water spray to keep the dust down.
- Clean-up after the job is important. Do not dry sweep or use compressed air. Contain any contamination.

COMPATIBILITY INFORMATION

GROUP 16 thermal insulation materials are normally non-reactive.

CONTROL MEASURES	PPE
1. When working with asbestos insulations, or with insulation materials where the fiber type is not known, follow the "Asbestos Control Program Elements" detailed in the NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Chapter B1.	
2. For asbestos insulation, use a tent or glove bag to isolate work areas. Ensure that local exhaust ventilation, in the form of a High Efficiency Particulate Air (HEPA)-filtered vacuum cleaner, is provided at the point of airborne fiber generation.	
3. For non-asbestos insulation, secure or redirect ventilation so that the air movements do not disturb loose fibers.	
4. For asbestos insulation, wear a full-facepiece continuous flow supplied-air	**RESPIRATOR** (mandatory)

respirator (with AABA or modified pressure-demand EAB).

5. For non-asbestos insulation, wear, at a minimum, a half-face air-purifying respirator equipped with high efficiency particulate air, P-100 (purple-coded) filters for concentrations up to 10 times the occupational exposure limit.

RESPIRATOR
(situational)

6. When a full facepiece respirator is not in use, wear vented safety goggles if eye protection is needed or if the possibility of eye irritation exists.

EYE PROTECTION
(mandatory)

7. When working with asbestos insulation, wear disposable coveralls (full body) with an attached hood. The coveralls should be made of Tyvek. Make sure that the garment fits snugly about the neck, wrists, and ankles. The wrists and ankles should be taped to seal connections with the gloves and booties, respectively.

8. When working with non-asbestos insulation, wear the same coveralls specified above in paragraph 7 for the best protection.

9. Wear disposable polyethylene gloves (gauntlet style) over the required cotton gloves when working with asbestos or non-asbestos insulation. Make sure that the gloves and all openings are taped closed.

HAND PROTECTION
(mandatory)

10. Wear rubber boot covers when working with asbestos or non-asbestos insulation. Make sure that all openings are taped closed.

FOOT PROTECTION
(situational)

PRECAUTIONS: (Thermal insulation)

1. Avoid breathing any amount of thermal insulation fibers or dust.

2. Avoid skin and eye contact with thermal insulation materials.

3. Avoid creating dusts. When working with thermal insulation, wet or dampen thermal insulation materials with water to reduce the quantity of airborne fibers or dust.

4. Do not store or eat food, drink, or use tobacco products in regulated insulation work areas. Also, do not smoke, chew tobacco or gum, or apply cosmetics in the regulated work areas.

5. Before eating, at breaks, and at the end of the work period, wash hands and face thoroughly with soap and water or shower to remove any fibers from the skin.

6. Ensure that non-disposable clothing contaminated with thermal insulations is laundered separately from other clothing. (See Naval Ships Technical Manual (NSTM 020 July 2003), Chapter 635 “Thermal Insulation” for complete precautions.)

7. Store fibrous thermal insulation materials in sealed, properly marked heavy duty polyethylene bags. (See Naval Ships Technical Manual (NSTM 020 July 2003), Chapter 635 “Thermal Insulation” for complete precautions.)

HEALTH HAZARDS:

1. Thermal insulation materials frequently contain asbestos fibers, ceramic fibers, fibrous glass, or mineral wool. These components are recognized health hazards:

- Asbestos is a known human carcinogen.

- Ceramic fibers, fibrous glass, and mineral wool can cause various lung diseases, and some have been identified as potential human carcinogens.

The primary concern is the inhalation of these fibers.

Adverse health effects such as asbestosis (a lung disease characterized by shortness of breath), mesothelioma (a cancer of the lining of the body cavity), lung cancer, and other chronic lung diseases may not show up until many years after initial exposure. Workers who smoke have a higher risk than non-smokers.

2. There are no known immediate health effects or exposure symptoms, beyond itching or irritation, at the time of exposure to thermal insulation containing asbestos, ceramic fibers, fibrous glass, or mineral wool. Therefore, wear the PPE specified by your safety Officer for maximum protection, especially the correct respirator, to avoid exposure to any amount of fibers.

Most thermal insulating material fibers can pierce the skin causing itching and irritation. If the skin is irritated when working with thermal insulation, wash the affected areas with soap and warm water. Report the condition to your supervisor.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from the contaminated area.

2. Secure or redirect ventilation in the spilled or damaged insulation areas so that the air movements are small enough to limit disturbance of loose fibers.

3. Ensure that PPE such as goggles, gloves, full body coveralls, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is gloves, goggles, taped coveralls, and a high efficiency particulate respirator for concentrations up to 10 times the occupational exposure limit. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

4. Isolate insulation spills or damaged insulation areas using drapes and drop cloths.

5. Put up visible warning signs.

6. Wet or dampen the insulation materials with water and then gently scrape the materials into an approved plastic bag. Seal the bag tightly.

7. Clean up areas contaminated with thermal insulation fibers using a vacuum cleaner equipped with a HEPA filter.

8. Remove drapes, drop cloth, and all disposable PPE contaminated with fibers into a plastic bag. Seal the bag pending disposal ashore.

9. If the insulation is suspected or known to contain asbestos material, follow spill procedures provided in OPNAVINST 5100.19D, Chapter B1.

DISPOSAL GUIDELINES:

1. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

2. Properly wet used/excess insulation material (including contaminated disposable PPE) and place in an approved plastic bag for disposal ashore (asbestos-containing material must be double bagged). Consult your HAZMINCEN for guidance.

3. In an emergency, consult your HAZMINCEN for guidance.

GROUP 17: WATER TEST AND TREATMENT CHEMICALS

The water test and treatment chemical group contains chemicals classified as acids, alkalies, poisons, flammable, or oxidizers. Examples of some test and treatment chemicals are trisodium phosphate, dissolved oxygen ampoule, hardness buffer, hardness titrating solution, morpholine, silica one reagent, caustic soda, citric acid, and nitric acid. Examples of some toxic chemicals are mercuric nitrate, hydrazine, ethylenediamine tetraacetic acid (EDTA), and sodium nitrite. These chemicals were grouped under Water test and Treatment Chemicals because, although they may also fit under other groups, most are found in very small quantities, used by very few people, and may be components of assembled kits.

Safety guidance and personal protective equipment (PPE) suitable for the corrosive and toxic nature of materials in this group are given below as Control Measures. Proper use of PPE will protect against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- These chemicals are usually stored in the Water or Oil Lab, and are not issued by the HAZMINCEN. MSDSs must be requested from the HAZMINCEN.
- Acid lockers with acid resistant shelving are required for acid storage.
- Although normally used in small quantities, careful handling is required to avoid contamination and exposure.

COMPATIBILITY INFORMATION

GROUP 17 water treatment chemicals are incompatible with groups 1, 3, 18, and 21.

CONTROL MEASURES	PPE
1. When working with corrosive water test and treatment chemicals, wear a long-sleeved shirt or lab coat with the sleeves rolled down (especially during mixing and pouring).	
2. Ensure that local exhaust ventilation (fixed or temporary) exists in the areas where water treatment chemicals are being dissolved or used.	
3. If using morpholine in poorly ventilated spaces, ask your Respiratory Protection Manager about respirator requirements.	**RESPIRATOR** (situational)
4. When working with powdered water test and treatment chemicals in a situation where chemical dusts may be inhaled (e.g. measuring out chromate powder for diesel engine soluble oil chloride test), ask your Respiratory Protection Manager about respirator requirements.	**RESPIRATOR** (situational)
5. Wear rubber gloves at all times while	**HAND PROTECTION**

working with water treatment chemicals. (mandatory)

6. Wear splash-proof chemical goggles when dissolving or pouring concentrated water test and treatment chemicals (for example, pouring into boilers or injection tanks). **EYE PROTECTION** (mandatory)

7. Use a full-length face shield in addition to goggles for face and neck protection (especially when mixing or pouring treatment chemicals in boilers or injection tanks). **FACE PROTECTION** (situational)

8. Wear a rubber apron when working with concentrated water test and treatment chemicals. **SKIN PROTECTION** (situational)

9. The above PPE control measures for chemical cleaning operations also apply to electronic cooling water systems. Chemical cleaning procedures are provided in NSTM 532.

PRECAUTIONS: (Water Test And Treatment Chemicals)

1. Avoid skin, eye, and clothing contact with water test and treatment chemicals.

2. Use a scoop/stirrer, not hands, when measuring or mixing water test and treatment chemicals.

3. Avoid breathing dusts and vapors of water test and treatment chemicals.

4. Use only cold or room-temperature water to dissolve caustic water test and treatment chemicals.

5. When working with concentrated water test and treatment chemicals or any laboratory chemicals, use the correct concentration. Follow all dilution and mixing directions.

6. Never mix a water treatment chemical with another substance unless instructed to do so by written procedures.

7. Use a water treatment chemical only for its intended purpose. DO NOT use any water treatment chemical for unauthorized applications (such as a cleaning agent).

8. Store water test and treatment chemicals in cool, dry storage areas. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D) Appendix C23-C and D15-E for shipboard storage compartments.)

9. Store morpholine and isopropyl alcohol in a designated flammable liquid storeroom, cabinet, or locker.

10. Store acidic water test and treatment chemicals separately from caustic water test and treatment chemicals.
11. Store full and spent hydrazine bottles in the approved storage locker in accordance to the guidance in NSTM 220, Volume II.

HEALTH HAZARDS:

1. Special attention and alertness should be given to skin contact when using HYDRAZINE; it is a suspected human carcinogen and can constitute a serious health hazard to personnel as a result of skin contact or by inhalation of vapors. Hydrazine readily penetrates the skin in potentially harmful amounts.

2. Skin contact with water test and treatment chemicals can result in a minor skin rash or very painful chemical burns depending on the concentration.

If water test and treatment chemicals contact the skin, remove the contaminated clothing and wash the affected area immediately with a large amount of water for at least 15 minutes. Seek prompt medical attention following eye/skin flushing or at any time a rash or other skin condition is noticed that could be related to working with water test and treatment chemicals. Report the incident to a supervisor.

3. Breathing dusts/vapors of water test and treatment chemicals can irritate or severely damage the lining of the nose, throat, or lungs.

If you experience breathing discomfort (coughing/choking) or irritation in the nose, throat, or lungs while working with water test and treatment chemicals, stop work and go to an area with fresh air. Obtain medical attention. Consult your Respiratory Protection Manager for guidance.

4. Eye contact with water test and treatment chemicals can cause discomfort or even loss of vision.

If boiler water or water test and treatment chemicals are splashed in the eyes, stop work and go to the nearest eye-wash right away. Flush the eyes, including under the eyelids, for at least 15 minutes. Get medical attention immediately, even if the injury does not appear to be severe.

5. Ingestion of water test and treatment chemicals can cause serious illness or death.

If a water treatment chemical is accidentally swallowed, call for medical attention immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate unprotected persons from the area of the spill involving water test and treatment chemicals that are corrosive.

2. Ensure that PPE such as goggles, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. If the spilled chemical is in powdered form, scoop the spill into an approved container for shore disposal. Consult your HAZMINCEN for guidance.

4. If the spilled chemical is an acidic solution, use a weak base such as sodium bicarbonate (baking soda) to neutralize. If the spilled chemical is a caustic solution, use a weak acid such as diluted acetic acid to neutralize. (Never use a strong acid or strong base as a neutralizing solution.) Have the spill tested for pH
to determine if the spill is adequately neutralized (pH = approximately 7). Additional guidance for the neutralization of spilled acid or base solutions can be found in NSTM 593, section 593-5.10.10.

5. Once the spill is neutralized and diluted, the spill may be flushed overboard or into the sewage system using large amounts of water. Consult your HAZMINCEN for guidance.

6. If the spilled water treatment chemical is mercuric nitrate, use an absorbent to collect the liquid, place it into an approved container and label in accordance with NAVOSH Manual (OPNAVINST 5100.19D) Section B0306 guidelines. (DO NOT flush into sewage system.)

7. If a spill involves a fire, use carbon dioxide or a dry chemical extinguisher to fight the fire.

NOTE: Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) when fighting a water treatment chemical fire.

8. Desiccant material which has spilled out of its packaging will be cleaned up in the same manner as insulation materials due to the possible presence of crystalline silica. See Group 16 “Thermal Insulation” of this guide.

9. If there is a spill involving stock hydrazine or a leakage of a stock hydrazine bottle or treatment solution, refer to NSTM 220, Volume II, for hydrazine spill response guidance.

DISPOSAL GUIDELINES:

1. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

2. Water test and treatment chemicals/residues left in boiler treatment tanks must be disposed of ashore.

4. In port, spent water test and treatment chemicals in boiler cleaning processes shall be offloaded to tank, barge, or truck. Underway, consult your HAZMINCEN for guidance.

5. Excess stocks of concentrated water test and treatment chemicals shall be containerized for proper shore disposal.

6. Containerize excess mercuric nitrate and all rags, empty bottles/plastic bags, and samples contaminated with mercuric nitrate for shore disposal. Label containers as “Mercury Wastes”. If available, process mercuric samples through an ion exchange cartridge; overboard discharge of cartridge effluent is permitted. Containerize exhausted cartridge for shore disposal.

7. In port, boiler lay up solution shall be off loaded to tank, barge, or truck. Underway, consult your HAZMINCEN for guidance. Skin contact with hydrazine lay up solution must be avoided.

8. The disposal of water containing corrosion inhibitors is dependent on the specific HM. Consult your HAZMINCEN for guidance.

GROUP 18: OXIDIZERS

The oxidizer group includes materials that easily generate oxygen and cause other materials to become fire hazards. Oxidizers are also skin irritants. Examples of oxidizing materials are chlorine laundry bleach, calcium hypochlorite, calcium oxide, oxygen breathing apparatus (OBA) canisters, oxygen candles, and other chemicals such as lithium hydroxide, hydrogen peroxide, and sodium dichromate.

Safety guidance and personal protective equipment (PPE) suitable for the irritant nature of materials in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injury and long-term health effects.

Ask your supervisor or the Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of PPE you need for a particular job.

RISK ASSESSMENT

- Oxidizers are highly reactive and are some of the most HM a sailor may use. Fortunately they are not frequently handled.
- It does not take much oxidizer, mixed with an organic material, to cause a heat/fire reaction – oily residue on a deck is enough.
- As these items age, their plastic bottles become brittle and can shatter when handled.
- Eye contact with oxidizers can cause extreme pain and disorientation. Do not work alone when handling oxidizers.

COMPATIBILITY INFORMATION

GROUP 18 oxidizers are incompatible with the following Groups 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 15, 17, 19, 20, 21, and 22.

CONTROL MEASURES	PPE
1. When working with oxidizers, wear a long-sleeved shirt with the shirt sleeves rolled down.	
2. Wear neoprene gloves at all times when working with oxidizers.	**HAND PROTECTION** (mandatory)
3. When working with oxidizers in a situation where the dusts/mists may be inhaled, see your Respiratory Protection Manager about the requirement for a respirator.	**RESPIRATOR** (situational)
4. Wear non-vented chemical goggles when working with powdered or liquid oxidizers.	**EYE PROTECTION** (mandatory
5. Use a face shield in addition to eye goggles for face and neck protection when pouring or mixing oxidizers (more than one gallon, for example).	**FACE PROTECTION** (situational)

PRECAUTIONS: (Oxidizers)

1. Avoid skin and eye contact with oxidizers.

2. Avoid breathing the dust or vapors of oxidizers.

3. Do not remove or destroy warning labels from containers containing oxidizers.

4. When transferring oxidizers to second containers, make sure the second container is compatible with the oxidizing material. Place appropriate warning labels on the new container. Contact your HAZMINCEN for appropriate guidance.

5. Do not use oxidizers near flammable materials such as fuels, solvents, oils, greases, paints, or cellulose products. If oxidizers must be used near flammable materials, make sure ignition sources such as sparks, flames, heaters, cigarettes, and electrical equipment are not present.

6. Never mix oxidizers with other chemicals unless following written manufacturer's instructions. Mixing oxidizers with some substances can cause a fire or explosion.

7. Return oxidizers to proper storage upon completion of the job. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D), Appendix C23-C and D15-E for shipboard storage compartment).

8. Store oxidizers only in designated cool, dry areas. Never store oxidizers in the same compartment with easily oxidizable materials such as fuels, solvents, oils, greases, paints, or cellulose products such as wood, paper, and plastics.

9. Do not store oxidizers in areas adjacent to magazines, heat sources, or where the temperature may exceed 100 degrees Fahrenheit.

10. Store oxidizers in their original containers. Make sure containers are tightly sealed.

11. Keep oxidizers away from metal surfaces, heat, and direct sunlight.

HEALTH HAZARDS:

1. Skin contact with oxidizers can result in skin irritation/rash. Prolonged contact can cause skin rashes.

If powdered oxidizers contact the skin, brush all the dry powder off and wash the affected area immediately with large amounts of water for at least 15 minutes. If oxidizers in liquid solution contact the skin, was the affected area immediately with large amounts of water for at least 15 minutes. Obtain medical attention immediately.

2. Breathing oxidizer dusts or vapors can irritate or severely damage the lining of the nose, throat, or lungs. Oxidizers containing hexavalent chromium, such as alodine, sodium dichromate, and chromic anhydride, may constitute a potential cancer threat if personnel are overexposed. Inhalation is the prime path of exposure.

If experiencing breathing discomfort (coughing/choking) or irritation in the nose, throat, or lungs while using oxidizers, stop work and go to an area with fresh air. Report the incident to your supervisor. Seek medical attention if necessary.

3. Oxidizer dusts or vapor can cause discomfort to the eyes. Direct eye contact can cause permanent eye damage.

If powdered oxidizers contact the eyes, brush away all dry powder and immediately go to the nearest eye-wash station. If oxidizers in liquid solution contact the eyes, immediately go to the nearest eye-wash station. Flush the eyes including under the eyelids for at least 15 minutes. Obtain medical attention immediately, even if the injury does not seem severe.

4. Ingestion of oxidizers is harmful and can damage the digestive tract.

If an oxidizer is accidentally swallowed, call for medical assistance immediately. DO NOT induce vomiting or eat or drink anything unless instructed to do so by a qualified medical person.

SPILL CONTROL:

1. Evacuate all unprotected persons from the spill area.

2. Ensure that PPE such as goggles, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Stop the leak or spill source if it can be done without risk.

4. Collect the spilled oxidizer in an approved container using inert absorbents; put a warning label on the container pending shore disposal. (See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D) Appendix C23-A, or NSTM Chapter 593, Appendix A and Appendix B for approved containers.)

5. Flush the spill area with large amounts of water and ventilate the area well to dilute vapors. Avoid breathing the vapors.

6. If an oxidizer spill involves fire, report the fire in accordance with established procedures. Use carbon dioxide or a dry chemical extinguisher to fight the fire.

NOTE: Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) in the event of a fire.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Store excess oxidizing materials in the original container or approved properly labeled containers pending shore disposal. Consult your HAZMINCEN for guidance.

GROUP 19: FUELS

The fuels group includes regular or unleaded gasoline, kerosene, diesel fuel, and JP-5 and JP-8 jet fuels. The primary dangers and concerns with the fuels group are fire/explosion hazards and vapor inhalation, and skin absorption.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or the Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Fuels are often misused as solvents and cleaners.
- Breathing fuel vapors can be hazardous.
- Gas-free services are prudent prior to entering any space containing fuel vapors.
- Proper ventilation is critical in fuel pump rooms and storage areas.

COMPATIBILITY INFORMATION

GROUP 19 fuels are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18).

CONTROL MEASURES	PPE
1. Ensure that local exhaust ventilation (fixed or portable) is in operation in in the areas of fuel-operations such as filling tanks, defueling, or spilled-fuel clean up. Ensure that local exhaust ventilation (fixed or portable) is in operation when performing maintenance on fuel handling/filtering equipment.	
2. If local exhaust ventilation cannot be provided and the work would result in breathing fuel vapors, consult your Respiratory Protection Manager about the requirement for respiratory protection. . If there is concern regarding insufficient oxygen or explosive vapors, have the Gas-Free Engineer check the space.	**RESPIRATOR** (situational)
3. Wear, at a minimum, a full-face continuous-flow supplied air respirator when working with fuels in confined spaces. Ensure that the confined space has been checked by the Gas-Free Engineer prior to entry. Only full-face pressure-demand self	**RESPIRATOR** (situational)

contained breathing apparatus (SCBAs) or combination full-face pressure-demand airline respirators with emergency escape auxiliary air cylinders can be worn into confined spaces that contain unknown atmospheres or atmospheres that are immediately dangerous to life or health.

4. Wear splash/vapor-proof chemical goggles at all times while working with fuels unless a full-facepiece respirator is in use.

EYE PROTECTION (mandatory)

5. If the hands may come in contact with fuels, wear butyl rubber gloves to prevent prolonged, repeated skin contact.

HAND PROTECTION (situational)

6. Use a face shield over the eye goggles to protect the face and neck in situations where fuel splashing is possible or expected (for instance, when filling fuel tanks, working with fuel injection equipment/tester, or working with fuel systems under pressure).

FACE PROTECTION (situational)

7. Wear a polyethylene splash suit or coveralls when splashing of fuels is possible.

PRECAUTIONS: (Fuels)

1. Avoid repeated and prolonged skin contact with fuels.

2. Avoid splashing of fuels onto eyes, skin, and clothing.

3. Avoid breathing fuel vapors. Use respiratory protection if vapors are present.

4. Use pumps to transfer fuels; never use the mouth to siphon.

5. Keep fuel tanks/containers closed.

6. Use a particular fuel only for its intended purpose; fuels such as gasoline/diesel fuel/kerosene shall NOT be used for cleaning purposes under any circumstances.

7. DO NOT allow smoking or carrying of matches, lighter, or any spark producing devices when handling fuels.

8. Use only approved, explosion-proof, protected lights when working near fuels (See supervisor for additional guidance).

9. Store fuels in containers only in areas free from sources of ignition, spark, open flames, and oxidizers such as calcium hypochlorite, sodium nitrate, and hydrogen peroxides.

10. DO NOT enter or allow anyone to enter any fuel tank or storeroom that has not been declared safe for entry by the Gas-Free Engineer.

11. Store fuels in designated tanks or flammable liquid storerooms. (See NAVOSH Program Manual (OPNAVINST 5100.19D), Chapter C-10 for shipboard storage compartments.) Make sure tanks/containers are tightly closed.

12. Follow all fuel transfer precautions listed in NAVOSH Manual (OPNAVINST 5100.19D), Chapter C-10.

HEALTH HAZARDS:

1. Fuel vapors can irritate the nose, throat or lungs. Fuel vapors may contain trace amounts of lead compounds and other toxic chemicals (e.g., benzene). Long-term health effects include possible blood, liver, kidney, or lung damage.

If experiencing light-headedness, difficulty in breathing or coughing due to irritation in the nose, throat, or lungs while working with fuels, stop work and go to an area with fresh air. Report the incident to a supervisor. Seek medical attention if necessary.

If a worker is overcome by breathing too much fuel vapor, take the person to fresh air immediately. Give artificial respiration if breathing has stopped. Obtain medical attention immediately. (CAUTION - put on proper respiratory protective equipment such as a SCBA or a pressure-demand supplied air respirator with an auxiliary air supply prior to attempting a rescue of a person in an isolated compartment or tank. Use of an emergency escape breathing device (EEBD) is not permitted for entering a tank or void.) Never use an oxygen breathing apparatus (OBA) in flammable atmospheres due to the heat generated by the canister.

2. Direct skin exposure to fuels can result in drying of the skin or irritation that may result in dermatitis, a skin disease.

If fuels contact the skin, wash the affected areas with soap and water as soon as possible after exposure.

If the skin becomes red, dry, or irritated or if cracks/blisters form after using fuels, wash the affected areas with soap and water. Report conditions to the supervisor and obtain medical attention.

3. Eye contact with fuels can cause discomfort and irritation.

If fuels contact the eyes, stop work, proceed to the nearest emergency eyewash station, and immediately flush the eyes, including under the eyelids, with water for at least 15 minutes. Obtain medical attention immediately.

4. Ingestion of fuels can cause damage to vital organs and the central nervous system.

If a fuel is accidentally swallowed obtain medical assistance immediately. DO NOT induce vomiting or eat or drink anything unless instructed to do so by a qualified medical person.

SPILL CONTROLS:

1. Evacuate all unprotected personnel from fuel spill areas. Remove all sources of ignition such as open flames, hot surfaces, electrical, static, or frictional/grinding sparks. In machinery rooms or other closed spaces with ignition sources or surface temperatures above the fuel's flash point, a blanket of Aqueous Film Forming Foam (AFFF) may be laid down to minimize the risk of fire or explosion.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Ventilate spill area. Stop or contain the leak/spill source if it can be done without risk.

4. Immediately use a pump to collect spilled fuels into a fire safe drum pending shore disposal. (See the supervisor for shipboard fire safe drums/containers). Use rags or absorbent material to collect fuel residues. Containerize all fuel contaminated rags/absorbent materials as used/excess flammable material. Rags/absorbent material contaminated with fuel residue is highly flammable.

5. Clean fuel-spilled areas using detergents and water.

6. If a fuel-spill involves fire, use carbon dioxide, water fog (if AFFF not available), halon, AFFF systems, or a dry chemical extinguisher to fight a fuel fire. DO NOT use solid streams of water to fight a fuel fire.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize all excess fuels in fire safe drums for proper shore disposal. See your supervisor for shipboard disposal guidelines. Consult your HAZMINCEN for guidance.

4. Place fuel-contaminated rags/absorbent materials in fire safe drums for shore disposal.

GROUP 20: HEAVY METALS

The heavy metal group includes such metals as beryllium, cadmium, chromium, copper, lead, magnesium, mercury, nickel, strontium chromate, tin, and zinc. Heavy metals are most dangerous when they are broken into small particles that can be inhaled (e.g., machining, sanding/blasting, fumes from welding, and mists from electroplating).

Safety guidance and personal protective equipment (PPE) suitable for the toxic nature of materials in this group are given below as Control Measures. Proper use of this PPE will protect you against potential injuries and long-term health effects. Additional information on the Lead Control program is available in the NAVOSH Manual (OPNAVINST 5100.19D), Chapters B10 and information on Mercury can be found in Chapter C2307f.

Ask your supervisor or Safety Officer for guidance when you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- The health effects of exposure to heavy metals include reproductive effects (male and female), damage to the unborn, and neurological damage. Avoiding inhalation and ingestion exposure is vital.
- Heavy metals are part of the pigments in many paints, so when sanded, heavy metals material can be easily inhaled.
- Heavy metal poisoning does not show up immediately – the effects are normally cumulative and may not show up for perhaps weeks, months, or even years. However, heavy short term exposures to heavy metals, especially cadmium, lead and mercury, can cause more immediate effects.

COMPATIBILITY INFORMATION

GROUP 20 heavy metals are incompatible with Corrosives, Corrosion Preventive Compounds, Photo Chemicals, Water Treatment Chemicals, Oxidizers, and Batteries (Groups 1, 3, 6, 13, 17, 18, and 21).

CONTROL MEASURES	PPE
1. Ensure local exhaust ventilation (fixed or portable) is in operation in the immediate working areas where heavy metal dusts, fumes, or vapors may exist. Consult an industrial hygienist to ensure adequate ventilation.	
2. When working with heavy metals in operations where small metal particles (metal dusts) are released into breathing air, ask your Respiratory Protection Manager about the need for a respirator. When working with heavy metals in operations such as welding, cutting, or brazing, where metal fumes may be inhaled, see your Respiratory Protection Manager about the need for a respirator.	**RESPIRATOR** (situational)
When working with small amounts	

of liquid mercury (gauge repair/ calibration or small spill) in areas where there is no local exhaust ventilation, see your Respiratory Protection Manager about the need for a respirator.

For large liquid mercury spill (greater than two ounces) or operations involving extensive mercury vapor, consult an industrial hygienist for respirator requirements.

2. Hand contact with metal dusts is a common means of ingestion; therefore, use protective gloves and thoroughly wash hands before eating, drinking, smoking, or applying cosmetics at breaks and at the end of the operation.

HAND PROTECTION
(situational)

3. Wear chemical goggles whenever the possibility of eye contact or irritation exists.

EYE PROTECTION
(situational)

PRECAUTIONS: (Heavy Metals)

1. Avoid breathing heavy metal dusts, fumes, or mercury vapors.

2. Avoid skin contact with heavy metal dusts, fumes, or vapors.

3. Do not store or eat food or drink in heavy metal working areas, especially when the metal is lead or mercury. Also, do not smoke, chew tobacco or gum, or apply cosmetics in the work area.

4. Heavy metal dusts, fumes, and vapors are toxic when breathed or ingested. Always exercise good personal hygiene. Wash hands with soap and water prior to eating, drinking, smoking, or applying cosmetics.

5. Do not use mercury near acetylene or ammonia.

6. Keep liquid mercury in the original bottle or in approved, properly labeled, plastic bottles or plastic-lined glass bottles. Make sure the bottle is tightly sealed. (See NAVSEAINST 5100.3D for labeling requirements.)

7. Store mercury in cool, dry mercury storage lockers. The locker shall be located in a designated, controlled, mercury handling areas.

8. Mercury may be released as a gas or boiling electrolyte from silver-zinc cells during a hot short. Take proper precautions to prevent inhalation of mercury gas or skin contact with electrolyte.

HEALTH HAZARDS:

1. Breathing air contaminated with heavy metal dusts, fumes, or mercury vapors can adversely affect the heart, kidney, liver, lungs, and the central nervous system.

Common symptoms for overexposure to heavy metals include: chest pain, headache, coughing, breathing difficulty, chills, and fever. If you work with heavy metals and have one of these symptoms, obtain medical attention.

2. Skin contact with certain metal dusts, fumes, or vapors such as beryllium, chromium, copper, mercury, nickel, tin, and zinc may result in skin irritations, skin ulcers, or sores.

Wash hands with soap and water upon completion of work and prior to eating, drinking, smoking, or applying cosmetics.

If the skin itches or becomes irritated during or after working with heavy metals, wash the affected areas with soap and water and obtain medical attention.

3. Eye contact with heavy metal dusts, fumes, or vapors can cause irritation, pain, and possible blindness.

If the eyes become irritated from working with heavy metals, stop work and obtain medical attention.

4. Ingestion of heavy metal substances may be poisonous.

If you accidentally eat or swallow a heavy metal, obtain medical attention immediately.

SPILL CONTROLS:

1. Evacuate unprotected persons from the area of a mercury spill.

2. Ensure that PPE such as goggles, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor or the Safety Officer for additional PPE requirements.

3. For a small mercury spill (less than 2 ounces), apply effective local ventilation to the immediate area of the spill. Direct ventilation overboard and keep the area as cool as possible.

4. Using the mercury spill cleanup equipment provided in the Hazardous Material/Waste Spill Response Kit, collect the spilled mercury into the approved container. See NAVSEAINST 5100.3D for mercury spill cleanup procedures and labeling requirements. See NAVOSH Program Manual for Forces Afloat (OPNAVINST 5100.19D) Appendix C23-A, or NSTM Chapter 593, Appendix A and Appendix B for appropriate bags/containers.

5. Masking tape should be used to clean up fine mercury residues.

6. For large spills (greater than 2 ounces) consult an industrial hygienist immediately to determine the PPE and mechanical ventilation required and to determine the concentration of mercury in the air. If an industrial hygienist is unavailable, the Navy On-Scene Commander (NOSCDR) or Respiratory Protection Manager should supervise the clean up.

7. For clean-up of other heavy metal containing materials (paint dust and chips, dust from lead shot, welding rod grinding dust), ensure that PPE such as goggles, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum protection is rubber gloves and splash-proof chemical goggles. Ask your supervisor or the Safety Officer for additional PPE requirements.

8. For toxic heavy metal dusts, such as lead, vacuum the area with a HEPA vacuum cleaner, use only wet wipe-down methods. Consult the HAZMINCEN for proper disposal of waste materials and decontamination of cleaning items.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Containerize heavy metals and used/excess heavy metal compounds in double plastic bags, sealable drums, or polyethylene bottles and properly label for shore disposal. Consult your HAZMINCEN for guidance.

4. Containerize mercury and mercury-contaminated materials such as rags in double plastic bags, sealable drums, or polyethylene bottles labeled for shore disposal. Label the container as “Mercury Waste” (see NAVSEAINST 5100.3D for labeling requirements).

GROUP 21: BATTERIES

The battery group is comprised of several different chemical types including lead-acid, alkaline, lithium, and dry cell batteries. Each chemical type has specific handling requirements based on the chemistry of the component materials. Guidance for the charging and management of batteries and battery-driven equipment can be found in NAVOSH Manual (OPNAVINST 5100.19D), Chapter C9. Examples of different battery types discussed in this chapter are as follows:

Battery Type	Examples
Alkaline	Nickel-cadmium, silver-zinc, and alkaline-manganese dioxide
Dry Cell	Carbon-zinc (Leclanche cell), heavy duty carbon-zinc, magnesium-manganese dioxide, and mercury-zinc
Storage	Lead-acid, alkaline, or dry cell (Storage batteries are cells or groups of cells that provide a sizeable amount of current and voltage for an extended period of time.)
Common	Dry cell or alkaline (includes AA, C, D and 9-volt)

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards associated with lead-acid batteries, alkaline batteries, lithium cells, and dry cells are given below as Control Measures. For additional guidance in handling the electrolyte in lead-acid batteries, see Group 1: ACIDS. For handling alkaline batteries, see Group 3: ALKALI/BASES/CAUSTICS. For additional guidance on batteries containing heavy metals, see Group 20: HEAVY METALS. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about what type of safety equipment you need for a particular job.

RISK ASSESSMENT

- Maintenance-free batteries are safer than batteries that require electrolyte testing and filling with sulfuric acid and are being substituted where authorized/approved.
- Eye protection is critical when handling batteries, especially lead-acid batteries.
- Lithium batteries are the most hazardous batteries, especially if burned or broken open.

COMPATIBILITY INFORMATION

GROUP 21 batteries are incompatible with Solvents, Oxidizers, and Heavy Metals (Groups 15, 18 and 20).

CONTROL MEASURES	PPE
1. Ensure that local exhaust ventilation (fixed or portable) is in operation in spaces containing liquid electrolyte batteries whether they are in storage, use, or being recharged.	
2. Wear butyl rubber gloves when working with liquid electrolyte batteries and when installing or removing all other battery types from equipment.	**HAND PROTECTION** (mandatory)

3. Wear splash-proof chemical goggles while working with liquid electrolyte batteries and when installing or removing all other battery types from equipment.

EYE PROTECTION
(mandatory)

4. Use a face shield in addition to splash-proof chemical goggles for face and neck protection when working with liquid electrolyte batteries, especially when changing battle lantern batteries and when working overhead.

FACE PROTECTION
(mandatory)

5. Wear a rubber apron when working with batteries containing liquid electrolyte.

SKIN PROTECTION
(situational)

6. Wear rubber boots when working with batteries containing liquid electrolyte.

7. Use insulated rubber mats, boots, electrical gloves when working with energized circuits and equipment. (Follow NSTM, Chapter 300).

NOTE 1: Alkaline, lithium, and dry cell batteries in their manufactured state do not present a chemical hazard to health or the environment. A potential hazard is created when these types of batteries are installed in equipment or if the batteries are mishandled. When installing or removing batteries into or from equipment, minimum PPE includes rubber gloves and chemical goggles. See NAVOSH Manual (OPNAVINST 5100.19D), or NSTM 593, Appendix D.

NOTE 2: Common battery types (AA-, C-, and D- cells as well as calculator and watch batteries) typically do not require PPE during installation or use. PPE is required for use with common batteries if the cells are broken or leaking.

PRECAUTIONS:

1. Avoid skin, eye, and clothing contact with battery liquids and metals.

2. Avoid breathing vapors/mists from battery electrolyte.

3. Always maintain as much distance as possible between you and battery electrolyte. If your clothing comes into contact with battery electrolyte, immediately change into a clean set of clothing.

4. No smoking, flames, or sparks are permitted in the vicinity of any battery.

5. Provide ventilation adequate for the number of batteries to charge.

6. Ensure that warning placards are in place to identify compartments where battery charging is in progress.

7. Temperature of battery charging stations should be kept below 96 degrees Fahrenheit. Electrolyte temperature should be kept below 125 degrees Fahrenheit.

8. Immediately remove dead batteries from equipment.

9. Never mix old and new batteries. Replace all batteries in a unit at the same time.

10. Open (de-energize) all switches for equipment connected to the battery prior to connecting or removing the battery. Consult your supervisor for any tag-out requirements.

11. Never mix batteries of different chemical types, sizes, or manufacturers.

12. Always replace used batteries with the same chemical type and size. Never replace dry batteries with lithium batteries and vice-versa.

13. Remove and survey or store dry cell batteries if the equipment they operate will not be in use for two weeks or more.

14. Never puncture, incinerate, or recharge mercury or lithium batteries.

15. Use insulated tools when working with batteries.

16. When working with storage batteries, avoid electric shock by preventing electrical path completion to ground.

17. Avoid contact with the terminals of a high-voltage battery.

18. Do not discharge batteries below the given low-voltage limit. Hydrogen and oxygen gas can be generated if a battery is discharged beyond this point and may lead to a hydrogen explosion that can injure personnel and damage equipment.

19. When pouring electrolyte into a battery, use a catch tray to collect any overfill or spilled material.

20. Prevent sea water contact with liquid electrolyte batteries. Chlorine gas will be generated from contact.

21. Store batteries in cool, dry, well-ventilated areas such as storage battery shops.

22. Store batteries of different chemical types and sizes separately to avoid contact of terminals and mixing of electrolytes (if liquid). Lead-acid batteries and equipment must be segregated from alkaline batteries and equipment.

23. Store unpackaged batteries separately. If contacts touch, the battery may short and generate heat.

HEALTH HAZARDS:

1. Skin contact with battery electrolyte can range from a minor skin rash to very painful chemical burns.

If electrolyte contacts the skin, wash the affected areas immediately with large amounts of water for at least 15 minutes. If necessary, go to the nearest emergency shower; remove contaminated clothing and stand under the shower for 15-20 minutes. Obtain medical attention immediately, even if the injury does not seem severe.

2. Breathing the vapors/mists of battery electrolyte can irritate or severely damage the lining of the nose, throat, or lungs.

If experiencing breathing discomfort (coughing/choking) or irritation in the nose, throat, or lungs while working with battery electrolyte, stop work and go to an area with fresh air. Obtain medical attention.

3. Eye contact with battery electrolyte may cause discomfort or loss of vision.

If battery electrolyte contacts the eyes, stop work and immediately go to the nearest emergency eyewash. Flush the eyes including under the eyelids, for at least 15 minutes.
Obtain medical attention immediately, even if the injury does not seem severe.

4. Ingestion of battery electrolyte can burn the mouth, corrode the teeth, and damage the digestive tract.

If battery electrolyte is accidentally swallowed, obtain medical assistance immediately. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

5. Electric shock from storage batteries can burn the skin or cause cardiac arrest or death.

If electric shock occurs, obtain medical attention immediately. Once a victim has been safely removed from the source of electric shock, perform CPR if the victim has gone into cardiac arrest until a qualified medical person arrives.

SPILL CONTROLS:

1. Evacuate all unprotected persons from the spill area.

2. Ensure that PPE such as goggles, faceshield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum protection includes rubber gloves and splash-proof chemical goggles. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

3. Stop the leak or spill source if it can be done without risk. Containerize the spilled electrolyte for shore disposal. See NAVOSH Manual (OPNAVINST 5100.19D) Appendix C23-A, or NSTM 593, Appendix A and B for approved containers. (DO NOT flush into the sewage system.)

4. Flush the spill area with large amounts of water or neutralize in accordance with the instructions of the applicable MSDS. Ventilate the area to release vapors. Avoid breathing the vapors. For additional acid battery electrolyte spill response guidance, refer to the Spill Controls section of HMUG Group 1: ACIDS.

5. If a battery spill involves a fire, report fire in accordance with established procedures. Use carbon dioxide or a dry chemical extinguisher to fight the fire.

NOTE: Wear an oxygen breathing apparatus (OBA) or a self contained breathing apparatus (SCBA) when fighting a battery fire.

NOTE: Use graphite powder (NSN 9620-00-498-2286) or LITH-X to extinguish a fire involving lithium batteries. If these materials are not available, use dry sodium chloride (table salt), dry calcium oxide (anhydrous), or dry lithium chloride. DO NOT use carbon dioxide, water, foam, or halogenated extinguishers on lithium battery fires.

6. Oxygen breathing apparatus (OBA) or SCBA is required during a hot short if a cell is emitting smoke (caustic potential). Protective clothing is also required. Seek the advice of the cognizant industrial hygienist to ensure adequate protection.

DISPOSAL GUIDELINES:

1. Comply with your own ship/station procedures for handling the disposal of HM and contaminated rags, absorbents, containers, and clothing.

2. Planned Maintenance System (PMS) disposal methods shall be followed during performance of PMS.

3. Batteries must be containerized for shore disposal. DO NOT empty electrolyte from batteries.

4. Battery electrolytes containing lead and other heavy metals must be containerized for shore disposal.

GROUP 22: PESTICIDES

Pesticides include rodenticides, fungicides, and insecticides. Only pesticides from the Authorized Shipboard Pesticide Use List (U.S. Navy Shipboard Pest Control Manual, Appendix A) may be used aboard Navy vessels. Pesticides are distributed in several forms including sprays, pellets, impregnated grains, and fumigants. Fumigants are applied in the form of smoke, vapor, or gas, and used where contact insecticides will not suffice. Since pesticides are poisonous to humans and require special equipment and skills in application, their use is restricted to qualified/trained personnel only. The presence or use of commercial (household) pesticides by the crew is not permitted.

Safety guidance and personal protective equipment (PPE) suitable for the chemical hazards in this group are given below as Control Measures. Proper use of this PPE will provide the necessary protection against potential injuries and long-term health effects.

Ask your supervisor or Safety Officer for guidance if you are in doubt about when or where to wear PPE or about the type of safety equipment you should wear for a particular job.

Consult the U.S. Navy Shipboard Pest Control Manual, Chapter 4, for pesticide use reporting requirements. Pesticide use reporting is required using DD Form 1532-1. Each month, every command is required to consolidate individual pesticide use reports and forward the resultant document directly to the Navy Environmental Health Center. Negative reports are required. Chapter 4 of the U.S. Navy Pest Control Manual also provides specific requirements for training and qualification of ship personnel authorized to use and apply pest control products.

RISK ASSESSMENT

- Pesticides can be highly toxic of improperly handled. Only personnel qualified to handle pesticides are authorized for their use and application.
- Pesticides in aerosol cans must be stored as flammables.

COMPATIBILITY INFORMATION

GROUP 22 pesticides are incompatible with Corrosives and Oxidizers (Groups 1, 3, and 18).

CONTROL MEASURES	PPE
1. Personnel should leave the space to be treated, with ventilation secured, and the area closed after treatment for the period of time specified on the label. Always ventilate the area for at least ½ hour before reentry. Consult the product label for other ventilation requirements.	
2. When applying spray pesticides, wear a half-face air purifying respirator equipped with pesticide (black-coded) cartridges and N-95 pre-filters. See your Respiratory Protection Manager for respirator requirements. If there is concern regarding oxygen level, have the Gas-Free Engineer check the space.	**RESPIRATOR** (mandatory)
3. Wear butyl rubber gloves when working with	**HAND PROTECTION**

pesticides. (mandatory)

4. Wear splash-proof chemical goggles when working with pesticides. **EYE PROTECTION** (mandatory)

5. Use a face shield over chemical goggles to protect the face and neck when spraying pesticides. **FACE PROTECTION** (situational)

6. Wear coveralls, a rubber apron, or a lab coat when working with pesticides, depending upon application. Immediately remove and launder clothing upon completion of work with any pesticide.

PRECAUTIONS: (Pesticides)

1. Follow directions on container before using.

2. Avoid skin and eye contact with pesticides.

3. Avoid breathing the vapors of spray pesticides and inhaling the dust from solid pesticides or pesticide impregnated grains.

4. Wash hands and face prior to eating, smoking, drinking, or applying cosmetics after working with pesticides.

5. After working with pesticides, immediately remove clothing and thoroughly shower. Have clothes laundered in hot, soapy water separately from street clothes.

6. If using pesticides in aerosol cans, ensure that the nozzle arrow is pointed away from the face.

7. Do not store aerosol cans in areas with temperatures above 120 degrees Fahrenheit.

8. Do not reuse empty pesticide receptacles and packaging.

9. Pesticides may only be applied by qualified/trained personnel.

HEALTH HAZARDS:

1. Avoid breathing pesticide vapors / aerosols or dust. Inhalation of pesticide vapors or dust can damage major organs or be fatal. Pesticides may displace breathing air.

If experiencing light-headedness, difficulty in breathing, or coughing due to irritation of the nose, throat, or lungs while using pesticides, stop work and go to an area with fresh air. Report the incident to a supervisor. Seek medical attention if necessary.

If a worker is overcome by breathing too much pesticide vapor / aerosol, get the person to fresh air immediately (CAUTION: Don SCBA prior to rescue). Give artificial respiration if breathing has stopped. Obtain medical attention immediately.

2. Pesticides are readily absorbed by the skin.

If a pesticide contacts the skin, wash the affected area immediately with large amounts of hot, soapy water. If necessary, go to the nearest emergency shower and remove contaminated clothing. Obtain medical attention immediately, even if the injury does not seem severe.

3. Eye contact with pesticides can cause irritation, blurred vision, or blindness.

If eye contact with pesticides occurs, stop work, immediately proceed to the nearest emergency eyewash station, and flush the eyes including under the eyelids with water for at least 15 minutes. Obtain medical attention immediately.

4. Ingestion of pesticides can be fatal and can damage vital organs and the central nervous system.

If a pesticide is accidentally swallowed, call for medical assistance right away. DO NOT induce vomiting or give the victim anything to eat or drink unless instructed to do so by a qualified medical person.

5. Pesticides, at any level of exposure, may be associated with problems during pregnancy.

Pregnant workers should consult with their treating physician(s) prior to using any pesticides.

SPILL CONTROLS:

1. If clothing becomes contaminated with spray pesticide, immediately stop work and leave the area. Remove clothing and footwear. Shower and thoroughly wash the skin. Ensure clothing and footwear are thoroughly washed. Seek medical advice.

2. Evacuate all unprotected personnel from the affected spaces. Remove all sources of ignition such as open flames, hot surfaces, electrical, static, or frictional/grinding sparks.

3. Ensure that PPE such as goggles, face shield, gloves, and correct respirators are on hand before attempting any spill control actions. Minimum required protection is rubber gloves, splash-proof chemical goggles, and a half-mask organic vapor respirator for concentrations up to 10 times the occupational exposure limit. Ask your supervisor, the DCA, or the Safety Officer for additional PPE requirements.

4. Ventilate spill areas. Stop or contain the leak/spill source if it can be done without risk.

5. If a pesticide spill involves a fire, report the fire in accordance with established procedures. Use dry chemical, carbon dioxide, or foam extinguisher to fight the fire. Wear a SCBA when fighting pesticide fires.

DISPOSAL GUIDELINES:

1. Containerize all used/excess pesticides for shore disposal. Turn-in waste and containers to your HAZMINCEN.

APPENDIX A
PERSONAL PROTECTIVE EQUIPMENT (PPE) SHOPPING GUIDE

THE NATIONAL STOCK NUMBERS (NSN) PROVIDED IN THIS SECTION WERE VERIFIED EFFECTIVE AS OF SEPTEMBER 2003. CHECK WITH YOUR SUPPLY DEPARTMENT PRIOR TO ORDERING TO ENSURE THESE STOCK NUMBERS ARE STILL VALID. ADDITIONAL STOCK NUMBERS FOR SAFETY EQUIPMENT ARE AVAILABLE IN THE NAVAL SAFETY CENTER PUBLICATION TITLED "SHIPBOARD SAFETY EQUIPMENT SHOPPING GUIDE" WHICH CAN BE DOWNLOADED BY GOING TO http://www.safetycenter.navy.mil/osh/afloat/downloads/shoppingguide/doc .

PPE IS LISTED BY SPIN (STANDARD PMS IDENTIFICATION NUMBER) FROM THE STANDARD PMS MATERIAL IDENTIFICATION GUIDE (SPMIG) GIVEN ON THE MAINTENANCE REQUIREMENT CARD (MRC).

REPORT ALL DAMAGED OR DEFECTIVE PPE TO YOUR SUPERVISOR IMMEDIATELY. REPLACE PRIOR TO USE.

RESPIRATORS:

NOTE: RESPIRATORY PROTECTION WILL BE SELECTED AND ISSUED BY THE COMMAND RESPIRATORY PROTECTION MANAGER (RPM) TO PERSONNEL SCREENED, FIT TESTED, AND TRAINED TO USE A RESPIRATOR.

NOMENCLATURE	SPMIG/SPIN	FSC	NIIN
Apron, laboratory	10724	8415	007150450
Apron, plastic, disposable	03993	8415	002228074
Apron, chemical-spill protective agents protective	00067	8415	002817813
Apron, chemical-spill protective agents protective	00067	8415	002817814
Apron, chemical-spill protective agents protective	00067	8415	002817815
Apron, utility	02996	8415	000826108
Apron, welder's	03705	8415	002502531
Boots, firemen's	00137	8430	010214071
Boots, firemen's	00137	8430	010214072
Boots, firemen's	00137	8430	010214073
Boots, firemen's	00137	8430	010214074
Boots, firemen's	00137	8430	010214075
Boots, firemen's	00137	8430	010214076
Boots, firemen's	00137	8430	010214077
Boots, firemen's	00137	8430	010214078
Breathing apparatus, oxygen generator	01812	4240	012975986
Breathing apparatus, oxygen generator	09484	4240	011169888
Breathing apparatus, self-contain	02161	4240	009192864
Breathing apparatus, self-contained	01335	4240	013670737
Coveralls, disposable	00515		
Coveralls, disposable	00515	8415	006010794
Coveralls, disposable	00515	8415	006010797

NOMENCLATURE	SPMIG/SPIN	FSC	NIIN
Coveralls, disposable	00515	8415	006010801
Coveralls, disposable	00515	8415	006010793
Coveralls, disposable	03220		
Coveralls, disposable	03220	8415	010927529
Coveralls, disposable	03220	8415	010927530
Coveralls, disposable	03220	8415	010927532
Coveralls, disposable	03220	8415	010927531
Coveralls, chemical-spill protective agents protective	02088		
Coveralls, chemical-spill protective agents protective	02088	8415	000996968
Coveralls, chemical-spill protective agents protective	02088	8415	000996970
Coveralls, chemical-spill protective agents protective	02088	8415	000996962
Faceshield, industrial	00418	4240	002405140
Faceshield, industrial	00419	4240	005422048
Faceshield, industrial	00420	4240	002029473
Footwear covers, chemical protection	03574		
Footwear covers, chemical protection	03574	8430	010215978
Footwear covers, chemical protection	03574	8430	011188172
Footwear covers, chemical-spill protective agent protective	03018		
Footwear covers, chemical-spill protective agent protective	03018	8430	002625295
Footwear covers, chemical-spill protective agent protective	03018	8430	002625297
Footwear covers, chemical-spill protective agent protective	03018	8430	002625296
Glove set, chemical protective	03575		
Glove set, chemical protective	03575	8415	010333519
Glove set, chemical protective	03575	8415	010333520
Glove set, chemical protective	03575	8415	010333518
Glove shells, electrical workers'	00532	8415	002643618
Glove, patient examining and treatment	02315	6515	004620832
Gloves, anti-flash	02825	8415	012679661
Gloves, chemical and oil protective	00517		
Gloves, chemical and oil protective	00517	8415	009162818
Gloves, chemical and oil protective	00517	8415	009162817
Gloves, chemical and oil protective	02086		
Gloves, chemical and oil protective	02086	8415	010137384
Gloves, chemical and oil protective	02086	8415	010137382
Gloves, chemical and oil protective	10725	8415	008237460
Gloves, chemical protective	00525		
Gloves, chemical protective	00525	8415	002668679
Gloves, chemical protective	00525	8415	002668675
Gloves, chemical protective	00525	8415	002668673
Gloves, chemical protective	00525	8415	002668677
Gloves, disposable	02826	8415	014478212

NOMENCLATURE	SPMIG/SPIN	FSC	NIIN
Gloves, electrical workers'	00523		
Gloves, electrical workers'	00523	8415	011589454
Gloves, electrical workers'	00523	8415	011589455
Gloves, electrical workers'	00523	8415	011589456
Gloves, electrical workers'	00523	8415	011589457
Gloves, electrical workers'	00523	8415	011589458
Gloves, electrical workers'	00523	8415	011589459
Gloves, electrical workers'	00523	8415	011589453
Gloves, electrical workers'	00526		
Gloves, electrical workers'	00526	8415	011589450
Gloves, electrical workers'	00526	8415	011589451
Gloves, electrical workers'	00526	8415	011589452
Gloves, electrical workers'	00526	8415	011589449
Gloves, electrical workers'	00527		
Gloves, electrical workers'	00527	8415	011589447
Gloves, electrical workers'	00527	8415	011589448
Gloves, electrical workers'	00527	8415	011589446
Gloves, electrical workers'	00528	8415	011589445
Gloves, firemen's	03572	8415	013357903
Gloves, heat protective	03042	8415	010923910
Gloves, chemical-spill protective agents protective	00533		
Gloves, chemical-spill protective agents protective	02085		
Gloves, chemical-spill protective agents protective	02085	8415	007536552
Gloves, chemical-spill protective agents protective	02085	8415	007536553
Gloves, chemical-spill protective agents protective	02085	8415	007536551
Gloves, welders'	00524	8415	002687860
Goggles, industrial	00101	4240	011699070
Goggles, industrial	00535		
Goggles, industrial	00536	4240	002033804
Goggles, industrial	03707	4240	011699070
Goggles, industrial	10142	4240	010635996
Harness, safety, industrial	00628	4240	000222522
Hood, anti-flash	00632	8415	012683473
Hood, gas mask, chemical-spill protective agent protective	03017	8415	002616690
Lanyard, safety harness	00739	4240	000222521
Lanyard, safety harness	03624	4240	000222518
Mask, air line	00874	4240	005413221
Nitrile gloves, special	09741	4240	014368838
Protector, hearing	00090	4240	007593290
SAR/SCBA	10813		
Shoes, gymnasium	02242		

NOMENCLATURE	SPMIG/SPIN	FSC	NIIN
Shoes, safety	01637		
Sleeve, safety, climbing	03984	4240	010429688
Spectacles, industrial	00088	4240	005164517
Spectacles, industrial	01312	4240	011400282
Spectacles, industrial	10949	4240	012529663
Spill clean-up, hazardous material	11245	4235	014292704
Suit, chemical protective	03573		
Suit, chemical protective	03573	8415	012148290
Suit, chemical protective	03573	8415	012148291
Suit, chemical protective	03573	8415	012148289

APPENDIX B
ITEM COMMON NAME TO GROUP INDEX

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
2-ethylhexanol, technical	15	02361	6810	007978621
Acetone, technical	15	00006	6810	002232739
Acetone, technical	15	00006	6810	001844796
Activator, photograph	13	05071	6750	006081092
Additive, coolant	15	11349	6850	014767761
Additive, fuel	15	09890		
Adhesive	2	03225	8040	013896930
Adhesive	2	03951	8040	012053995
Adhesive	2	09129	8040	010340401
Adhesive	2	09174	8040	002708136
Adhesive	2	09214	8040	011211439
Adhesive	2	09475	8040	008326173
Adhesive	2	00018	8040	005731502
Adhesive	2	00019	8040	002738707
Adhesive	2	00019	8040	002738708
Adhesive	2	00029	8040	008658991
Adhesive	2	00030	8040	001450020
Adhesive	2	00030	8040	001449774
Adhesive	2	00032	8040	001450075
Adhesive	2	00033	8040	002629031
Adhesive	2	00033	8040	002629028
Adhesive	2	00033	8040	002811972
Adhesive	2	00033	8040	002629026
Adhesive	2	00033	8040	002629025
Adhesive	2	00042	8040	005152246
Adhesive	2	01300	8040	008779872
Adhesive	2	01656	8040	000618303
Adhesive	2	02287		
Adhesive	2	02287	8040	001658614
Adhesive	2	02287	8040	008433461
Adhesive	2	02287	8040	007148223
Adhesive	2	02287	8040	008098252
Adhesive	2	02287	8040	002738716
Adhesive	2	02287	8040	002738717
Adhesive	2	02294		
Adhesive	2	02294	8040	006644318
Adhesive	2	02294	8040	002213811
Adhesive	2	02294	8040	002629005
Adhesive	2	02294	8040	002904301
Adhesive	2	02298		
Adhesive	2	02298	8040	010250237
Adhesive	2	02298	8040	008263535
Adhesive	2	02298	8040	010246988
Adhesive	2	02298	8040	001429193

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Adhesive	2	02616	8040	007534800
Adhesive	2	02823	8040	009321945
Adhesive	2	02863	8040	008430802
Adhesive	2	02959	8040	004448752
Adhesive	2	03068		
Adhesive	2	03068	8040	001429823
Adhesive	2	03068	8040	007283088
Adhesive	2	03068	8040	002254548
Adhesive	2	03706	8040	001818380
Adhesive	2	03768	8040	009419984
Adhesive	2	03933	8040	001178510
Adhesive	2	09752	8040	013317469
Adhesive	2	11116	8040	001450019
Adhesive	2	11123	8040	007856706
Adhesive	2	11130		
Adhesive	2	11199	8040	012503969
Alcohol	15	00039	6505	001049000
Alcohol, dehydrated	15	02103	6505	001050000
Alcohol, denatured	15	00038	6810	002010906
Alcohol, denatured	15	00038	6810	005437415
Alcohol, denatured	15	00038	6810	002010907
Alcohol, denatured	15	00038	6810	002010904
Alcohol, denatured	15	11211	6810	002056786
Alcohol, medicinal	15	02150		
All-purpose spray adhesive	2	11222		
Amazing cleaner	15	10526		
Ammonia water	3	03799		
Ampoule, dissolved oxygen	3	10930	6850	013604736
Anti-foam, compound, silicone	11	10828	6850	009268885
Antifreeze	15	00053	6850	014413218
Antifreeze	15	00053	6850	014413221
Antifreeze	15	00053	6850	014413223
Antifreeze	15	00053	6850	013834068
Antifreeze	15	02145	6850	006641409
Antifreeze	15	09784	6850	014553116
Anti-galling compound	6	09932	9150	014462164
Antiseize compound	6	04328	8030	002003782
Antiseize compound	8	00054	8030	002433285
Antiseize compound	8	00054	8030	000878630
Antiseize compound	8	00055	8030	002921102
Antiseize compound	8	00058	8030	010445034
Antiseize compound	8	00062	8030	008314171
Antiseize compound	8	00062	8030	012755050
Antiseize compound	8	01788	8030	001490335
Antiseize compound	8	04240	8030	005015084
Antiseize compound	11	00059	8030	002513980
Antiseize compound	11	00059	8030	000592761
Antiseize compound	11	00059	8030	002865453

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Antiseize compound	11	00059	8030	005975367
Antiseize compound	11	02393	8030	006646146
Antiseize compound	11	09747	0099	LLH839577
Anti-seize compound	8	09924	8030	005015084
Antistatic and cleaner compound	4	02324	6850	012839966
Armor all cleaner	4	03449	7930	003577386
Asbestos sheet, compressed	16	03274	5330	002222563
Asbestos sheet, compressed	16	03275	5330	002222564
Asbestos sheet, compressed	16	03321	5330	005279901
Asbestos sheet, compressed	16	03335	5330	013961328
Asbestos sheet, compressed	16	03365	5330	002222562
Asbestos sheet, compressed	16	03367	5330	006411192
Asbestos sheet, compressed	16	03369	5330	010307428
Asbestos sheet, compressed	16	03381	5330	005859496
Asbestos sheet, compressed	16	03385	5330	006411193
Asbestos sheet, compressed	16	06337	5330	001716030
Asbestos sheet, compressed	16	06852	5330	013840675
Barometer, aneroid	20	01978	6685	002904034
Battery, non-rechargeable	21	10732	6135	014992112
Battery	21	10279	0000	LLCYA6383
Battery assembly	21	01940	6140	012976202
Battery assembly	21	03769	6140	012274799
Battery assembly	21	04293	6135	001683721
Battery assembly	21	06629	6135	012308106
Battery assembly	21	07478	6140	013157887
Battery assembly	21	07479	6135	013157888
Battery assembly	21	08186	6135	012921071
Battery assembly	21	08388	6140	011923063
Battery assembly	21	09242	6140	014685954
Battery assembly	21	09600	6135	012294940
Battery assembly	21	09882	6140	013842414
Battery, ncg	21	08387	6140	011518255
Battery, nonrechargeable	21	09805	6135	014475082
Battery, nonrechargeable	21	09913	6135	014288821
Battery, nonrechargeable	21	00002	6135	000738939
Battery, nonrechargeable	21	00091	6135	013065880
Battery, nonrechargeable	21	00111	6135	009857846
Battery, nonrechargeable	21	00506	6135	012108715
Battery, nonrechargeable	21	01381	6135	013056958
Battery, nonrechargeable	21	01558	6135	009477091
Battery, nonrechargeable	21	01603	6135	009002139
Battery, nonrechargeable	21	01679	6135	008357210
Battery, nonrechargeable	21	01898	6135	012686726
Battery, nonrechargeable	21	02793		
Battery, nonrechargeable	21	02795	6135	010283095
Battery, nonrechargeable	21	03233	6135	002744035
Battery, nonrechargeable	21	03235	6135	002695843
Battery, nonrechargeable	21	03446	6135	000500915

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Battery, nonrechargeable	21	03803		
Battery, nonrechargeable	21	03863	6135	011864010
Battery, nonrechargeable	21	03978	6135	009857845
Battery, nonrechargeable	21	03980	6135	009260827
Battery, nonrechargeable	21	04057	6135	000503280
Battery, nonrechargeable	21	04294	6135	001683722
Battery, nonrechargeable	21	04295	6135	001683723
Battery, nonrechargeable	21	05010	6135	006433485
Battery, nonrechargeable	21	05537	6135	009735632
Battery, nonrechargeable	21	05827	6135	010937426
Battery, nonrechargeable	21	06605	6135	009268322
Battery, nonrechargeable	21	08247	6135	012633611
Battery, nonrechargeable	21	08593	6135	013401983
Battery, nonrechargeable	21	09026	6135	014821290
Battery, nonrechargeable	21	09648	6135	012682151
Battery, nonrechargeable	21	09746	6135	012146441
Battery, nonrechargeable	21	09806		008264798
Battery, nonrechargeable	21	10332	6135	013336101
Battery, nonrechargeable	21	10333	6135	013018776
Battery, nonrechargeable	21	10898	6135	014659477
Battery, nonrechargeable	21	10960	6135	001281632
Battery, nonrechargeable	21	11413	6135	014557946
Battery, nonrechargeable	21	11447	6135	014434484
Battery, nonrechargeable	21	11484	6135	014148831
Battery, nonrechargeable	21	11485	6135	013204815
Battery, storage	21	09925	6140	004496001
Battery, storage	21	10016	6140	014562987
Battery, storage	21	10407	6140	014594084
Battery, storage	21	00709	6140	011494810
Battery, storage	21	01933	6140	010415021
Battery, storage	21	03223	6140	010269949
Battery, storage	21	03512	6140	007382550
Battery, storage	21	04465	6140	002555719
Battery, storage	21	04623	6140	003509564
Battery, storage	21	04717	6140	004014956
Battery, storage	21	05614	6140	010152861
Battery, storage	21	05937	6140	011546935
Battery, storage	21	07640	6140	011179646
Battery, storage	21	08365	6140	001110500
Battery, storage	21	08366	6140	001110508
Battery, storage	21	08367	6140	001110512
Battery, storage	21	08368	6140	001110520
Battery, storage	21	08624	6140	001852071
Battery, storage	21	08697	6140	005026262
Battery, storage	21	08698	6140	010601983
Battery, storage	21	08699	6140	011817186
Battery, storage	21	08808	6140	003930914
Battery, storage	21	09821		004316805

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Battery, storage	21	10105	6140	013896178
Battery, storage	21	10106	6140	014576156
Battery, storage	21	10107	6140	014643896
Battery, storage	21	10334	6140	014904317
Battery, storage	21	10895	6140	014714877
Battery, storage	21	10920	6140	014863228
Battery, storage	21	11042	6140	014213189
Battery, storage	21	11445	6190	013583027
Battery, storage	21	11446	6140	013710519
Battery, storage 12V	21	09642	6140	013657743
Bearing dye, blue	10	09500	6850	003116172
Beeswax, technical	14	02689	9160	002531171
Bleach, laundry, organic chlorine	18	02379	6850	000632842
Boiler compound	17	02268	6850	002550429
Boiler water testing kit	17	00134	6630	003720839
Bonding kit	2	05338	5330	008827073
Brake fluid, automotive	9	00147	9150	001900932
Brake fluid, automotive	9	00147	9150	002319071
Brake fluid, automotive	9	09428	9150	011029455
Bromophenol blue solution	17	02641	6810	002817456
Buffing compound	14	02445	5350	001937225
Buffing compound	14	02445	5350	001845826
Buffing compound	14	02445	5350	001919774
Calcium chloride, anhydrous, acs	17	03750	6810	011262694
Calcium hypochlorite, technical	18	00093	6810	002550471
Calcium hypochlorite, technical	18	00093	6810	002424770
Calcium hypochlorite, technical	18	00093	6810	002388115
Calibrating gas mixture	5	02133	6830	002031492
Calibrating gas mixture	5	02142	6830	004064766
Calibrating gas mixture	5	09649	6830	014458231
Calibrating gas mixture	5	02575	6830	004984241
Calibrating gas mixture	5	03737	6830	011688488
Calibrating gas mixture	5	03738	6830	011086039
Calibrating gas mixture	5	03741	6830	002442285
Calibration fluid	11	01078	6850	011434525
Calibration gas	5	03948	6830	013409650
Calibration gas	5	04804	6830	004607704
Calibration oil	11	09406		LLH444505
Calibration oil	11	09405	6850	014701224
Calibration viscosity oil	11	09398	6850	014701231
Carbon dioxide, technical	5	02396	6830	001428841
Carbon removing compound	4	00237	6850	005437801
Carbon removing compound	4	00237	6850	005507453
Cartridge, carbon dioxide	5	00043	4220	003720585
Cartridge, carbon dioxide	5	01704	4220	008058383
Cartridge, chemical	5	05643	4610	010229970
Cartridge, oxygen removal	18	05136	4610	007760688
Cartridge, oxygen removal	18	10094	4610	014440242

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Cartridge, water demineralizer, ion exchange	17	03041	4610	003635770
Catalyst, carbon monoxide	18	04958	6850	014450557
Cell, battery	21	10894	6135	014615322
Cement, insulation, high temperature	2	00242	5640	002264540
Chemical pills, repl	17	11511	4220	014709908
Chloride solution	17	00254		
Chloride test table	17	02879	6850	002011257
Chloride titrator	17	01720	6850	001806165
Chlorine, test reagent	17	10788	6550	014568981
Citric acid reagent	17	09126	6810	013620042
Citric acid, anhydrous, technical	1	09528	6810	001412942
Citric acid, monohydrate	1	00646	6810	005976098
Citric acid, monohydrate, acs	1	00256	6810	002812014
Cleaner kit, disk	1	09644	7045	013167523
Cleaner, carburetor & choke	15	09888		
Cleaner, kit, z100	4	03716	7045	012302987
Cleaner, lubricant	11	03564	9150	006264404
Cleaner, lubricant and preservative	11	02057		
Cleaner, lubricant and preservative	11	02057	9150	010536688
Cleaner, lubricant and preservative	11	02057	9150	011021473
Cleaner, lubricant and preservative	11	02057	9150	010796124
Cleaner, lubricant and preservative	11	02057	9150	010546453
Cleaner, lubricant and preservative	11	02057	9150	013279631
Cleaner, magnetic tape head	15	02360		
Cleaner, membrane	3	09843	6850	014469518
Cleaner, membrane	3	09844		014469489
Cleaner, photographic	13	03617	6750	006913822
Cleaner, recorder head	1	09643	5835	014242782
Cleaner, recorder head	4	05346	5835	008853818
Cleaner, slidewire	4	02489	4931	004061511
Cleaner, solvent	15	10005		
Cleaner, ultrasonic	4	10223		
Cleaner, ultrasonic	4	10272	4940	006091554
Cleaning and lubricating compound	4	02422	6850	008807007
Cleaning and lubricating compound	4	03445	6850	009733122
Cleaning and lubricating compound	15	03178	6850	005709360
Cleaning compound	4	01999		
Cleaning compound	4	01999	6850	001817597
Cleaning compound	4	01999	6850	001817594
Cleaning compound	4	02565		
Cleaning compound, aircraft surface	4	00278		
Cleaning compound, aircraft surface	4	01580	6850	000055305
Cleaning compound, aircraft surface	4	01580	6850	010457929
Cleaning compound, aircraft surface	4	01580	6850	010457930
Cleaning compound, aircraft surface	4	01580	6850	010457931
Cleaning compound, aircraft surface	4	01580	6850	012240098
Cleaning compound, aircraft surface	4	09525	6850	013907828
Cleaning compound, avionic components	4	03867	6850	001487161

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Cleaning compound, concentrate	4	09876		
Cleaning compound, concentrate	4	09877		
Cleaning compound, concentrate	4	09878		
Cleaning compound, elec contact	4	00279	6850	006645640
Cleaning compound, engine cooling	1	03531	6850	005987328
Cleaning compound, general purpose	4	02827	6850	011085798
Cleaning compound, high pressure	3	02265		
Cleaning compound, high pressure	3	02265	6850	009652329
Cleaning compound, high pressure	3	02265	6850	002560157
Cleaning compound, optical lens	4	01286	6850	005923283
Cleaning compound, optical lens	4	03638	6850	001889875
Cleaning compound, optical lens	15	00280	6850	002271887
Cleaning compound, optical lens	15	00280	6850	003929751
Cleaning compound, rifle bore	4	00282	6850	002246657
Cleaning compound, rifle bore	4	00282	6850	007534806
Cleaning compound, rifle bore	4	00282	6850	002246663
Cleaning compound, rifle bore	4	00282	6850	002246656
Cleaning compound, solvent	15	03560	6850	013893880
Cleaning compound, solvent	15	03631	6850	013893859
Cleaning compound, solvent	15	00284	6850	009652359
Cleaning compound, solvent	15	00284	6850	009652360
Cleaning compound, solvent	15	00285	6850	009652331
Cleaning compound, solvent	15	00285	6850	005592836
Cleaning compound, solvent	15	00697	6850	012770595
Cleaning compound, solvent	15	09524	6850	013804369
Cleaning compound, solvent	15	09524	6850	013840618
Cleaning compound, solvent	15	04451	7930	013425317
Cleaning compound, solvent	15	09198	7930	013425316
Cleaning compound, solvent	15	09453	6850	013110192
Cleaning compound, solvent	15	00241	6850	000338851
Cleaning compound, solvent	15	00241	6850	003190834
Cleaning compound, solvent	15	00241	6850	006815688
Cleaning compound, solvent	15	00241	6850	009351082
Cleaning compound, solvent	15	00241	6850	012690513
Cleaning compound, solvent	15	00275	6850	009830282
Cleaning compound, solvent	15	01290	6850	001826467
Cleaning compound, solvent	15	02027		
Cleaning compound, solvent	15	02027	6850	013718049
Cleaning compound, solvent	15	02027	6850	013718048
Cleaning compound, solvent	15	02436	6850	002246665
Cleaning compound, solvent	15	02466	6850	001053084
Cleaning compound, solvent	15	03178		
Cleaning compound, solvent	15	03178	6850	013949514
Cleaning compound, solvent	15	09868	6850	011736391
Cleaning compound, solvent	15	10896	6850	013780044
Cleaning compound, solvent-detergent	4	01122	7930	013068369
Cleaning compound, solvent-detergent	4	03141	7930	013464289
Cleaning compound, solvent-detergent	4	10923	7930	014181151

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Cleaning compound, solvent-detergent	4	10923	7930	014181152
Cleaning compound, solvent-detergent	4	10923	7930	014181153
Cleaning compound, solvent-detergent	4	10923	7930	014181155
Cleaning compound, solvent-detergent	4	01904	7930	013425315
Cleaning compound, solvent-detergent	15	10486	7930	013300187
Cleaning compound, windshield	15	00276	6850	009262275
Cleaning kit, thermal head	15	09880	7045	014080016
Cleaning solution	4	02204		
Cleaning solution	4	03623	7930	012139285
Cleaning solution, optical	4	11034	6850	011967568
Cleaning solvent, approved safety	15	02407		
CO2 bottle	5	03132		
Coater, filter, air conditioner	12	02958	4130	008600042
Coating	12	03990	4935	012532227
Coating compound, metal pretreatment	1	00299	8030	001658577
Coating compound, metal pretreatment	1	00299	8030	005359780
Coating compound, metal pretreatment	1	03089	8030	008507076
Coating compound, nonslip	12	02593	8010	008572450
Coating kit, abrasion	12	02067	8030	000979088
Coating, ablative	12	02206	8030	001644389
Comparator, color	17	03207	6630	010673827
Comparator, color (chlorine & ph test)	17	10072		
Compound, molding	2	02836		
Compound, molding	2	02836	8030	002298736
Compound, molding	2	02836	8030	002298735
Conditioner, fuel	15	09892		
Corrosion preventive	6	09779		
Corrosion preventive compound	6	00312	8030	002728530
Corrosion preventive compound	6	00312	8030	002642063
Corrosion preventive compound	6	00318		
Corrosion preventive compound	6	00318	8030	002312345
Corrosion preventive compound	6	00318	8030	002441300
Corrosion preventive compound	6	00318	8030	002441299
Corrosion preventive compound	6	00318	8030	000626950
Corrosion preventive compound	6	00319	8030	002133279
Corrosion preventive compound	6	00321	8030	008376557
Corrosion preventive compound	6	00321	8030	002441293
Corrosion preventive compound	6	00321	8030	002441296
Corrosion preventive compound	6	00321	8030	002441294
Corrosion preventive compound	6	00322	8030	009381947
Corrosion preventive compound	6	00324		
Corrosion preventive compound	6	00324	8030	002441297
Corrosion preventive compound	6	00324	8030	002441295
Corrosion preventive compound	6	00324	8030	002441298
Corrosion preventive compound	6	01589	8030	013470983
Corrosion preventive compound	6	01589	8030	013470979
Corrosion preventive compound	6	02217	8030	009649169
Corrosion preventive compound	6	02598	8030	001450111

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Corrosion preventive compound	6	02598	8030	005152488
Corrosion preventive compound	6	02881	8030	009620685
Corrosion preventive compound	6	03035	8030	005468637
Corrosion preventive compound	6	03457	8030	005973288
Corrosion preventive compound	6	03497	8030	002312353
Corrosion preventive compound	6	03571	8030	005985915
Corrosion preventive compound	6	03639	8030	010595478
Corrosion preventive compound	6	03991	8030	010083058
Corrosion preventive compound	6	03992	8030	012977347
Corrosion preventive compound	6	09565	8030	013871070
Corrosion preventive compound	6	09567	8030	013863871
Corrosion preventive compound	6	09764	8030	014189006
Corrosion preventive compound	6	09764	8030	014189005
Corrosion preventive compound	6	09764	8030	014189007
Corrosion preventive compound	6	09764	8030	014189008
Corrosion preventive compound	6	09828		013817311
Corrosion preventive compound	6	09870	8030	013351401
Corrosion preventive compound	6	10034	8030	014384064
Corrosion Preventive Compound	6	10778	8030	001180666
Corrosion preventive compound	6	10815	8030	014846227
Corrosion preventive compound	6	11044	8030	010151550
Corrosion preventive, aircraft engine	6	01882	6850	001429582
Corrosion preventive, compound	6	09820	8030	014504009
Corrosion remover	6	00328	6850	010283063
Corrosion removing compound	6	03664	6850	001749672
Corrosion removing compound	6	09202	6850	013609650
Corrosion resistant coating	6	09145	8030	007794699
Corrosion resistant coating, chemical	6	00331	8030	006233180
Corrosion resistant coating, chemical	6	00331	8030	008113723
Corrosion resistant coating, chemical	6	01625	8030	001429272
Corrosion resistant coating, chemical	6	01625	8030	000650957
Corrosion, preventive	6	10561	6850	013283617
Cupric sulfate, acs	17	03744	6810	002411203
Cutting fluid	11	00349		
Cutting fluid	11	00349	9150	002345198
Cutting fluid	11	00349	9150	002526380
Cutting fluid	11	00349	9150	002618144
Cutting fluid	11	02446	9150	002526371
Cutting fluid	11	02446	9150	002526373
Cutting fluid	11	03240	9150	002316699
Cutting fluid	11	03240	9150	002659406
Cutting fluid	11	03240	9150	002319054
Cutting fluid	11	03247	9150	010135281
Cutting fluid, lapping operations	11	09937	9150	012614688
Cylinder, compressed gas	5	01728	8120	013561245
Cylinder, compressed gas	5	01731	8120	013561246
Cylinder, compressed gas	5	02362	8120	001781598
Cylinder, compressed gas, carbon dioxide	5	00351	8120	001818082

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Cylinder, compressed gas, dichloro	5	01714	8120	013554017
Cylinder, gas, nitrogen	5	03773	8120	012817715
Cylinder, gas, oxygen	5	03774		
D-A power fluid	11	01897		
Damping fluid	11	00354	9150	002698246
Damping fluid	11	03191	9150	000249624
Damping fluid	11	03453	9150	008644973
Decontaminating agent	7	03213	6850	012308556
Descaler, biodegrade	1	02185	6850	001487667
Desiccant replacement	17	05919	6605	011442000
Desiccant, activated	17	00358		
Desiccant, activated	17	00358	6850	002646568
Desiccant, activated	17	00358	6850	002646562
Desiccant, activated	17	00358	6850	002646574
Desiccant, activated	17	00358	6850	002646571
Desiccant, activated	17	00358	6850	002646572
Desiccant, activated	17	00358	6850	002646573
Desiccant, activated	17	00359	6850	002900042
Desiccant, activated	17	00630	6850	010369625
Desiccant, activated	17	01831	6850	009355810
Desiccant, activated	17	01861	6850	002606299
Desiccant, activated	17	01873	6850	008567955
Desiccant, activated	17	01876	6850	010548897
Desiccant, activated	17	01879	6850	010548898
Desiccant, activated	17	01880	6850	011434911
Desiccant, activated	17	02314	6850	008652418
Desiccant, activated	17	03157	6850	012131235
Desiccant, activated	17	03182	6850	006802233
Desiccant, activated	17	03441	6850	002929717
Desiccant, activated	17	03442	6850	009269156
Desiccant, activated	17	03443	6850	009269155
Desiccant, activated	17	03455	6850	001671676
Desiccant, activated	17	03502	6850	007381672
Desiccant, activated	17	03530	6850	009359878
Desiccant, activated	17	06034	6850	012622989
Desiccant, activated	17	06169	6850	012258015
Desiccant, activated	17	06500	6850	008518725
Desiccant, activated	17	07001	6850	006896438
Desiccant, activated	17	07965	6850	011126490
Desiccant, activated	17	08989	6850	013629257
Desiccant, activated	17	09154	6850	006802234
Desiccant, activated	17	10766	6850	009359794
Detector, leak	10	03770	4940	010146037
Detergent	7	09834		
Detergent, general purpose	7	00362		
Detergent, general purpose	7	00362	7930	005319715
Detergent, general purpose	7	00362	7930	005319716
Detergent, general purpose	7	00365		

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Detergent, general purpose	7	00365	7930	001775243
Detergent, general purpose	7	00365	7930	003577386
Detergent, general purpose	7	00365	7930	000681669
Detergent, general purpose	7	00365	7930	009265280
Detergent, general purpose	7	00366		
Detergent, general purpose	7	00366	7930	002829700
Detergent, general purpose	7	00366	7930	002829699
Detergent, general purpose	7	00366	7930	009856911
Detergent, general purpose	7	00760	7930	005152477
Detergent, general purpose	7	02785	7930	005581111
Detergent, general purpose	7	02856	7930	005308067
Detergent, general purpose	7	10560	7930	011291128
Detergent, laundry	7	00363		
Detergent, laundry	7	00363	7930	009291220
Detergent, laundry	7	00363	7930	009907391
Detergent, laundry	7	00363	7930	013126389
Dichlorodifluoromethane, technical	5	03542	6830	009022430
Dichlorodifluoromethane, technical	5	00368	6830	002904377
Dichlorodifluoromethane, technical	5	00368	6830	002904376
Diesel fuel, marine	19	01646		
Dishwashing compound, machine	7	00374	7930	009856906
Disinfectant-detergent, general	7	01548	6840	005261129
Disinfectant-detergent, general purpose	7	02355	6840	009261686
Disk cleaning kit	15	02128	7045	013093489
Dispersant	15	00099	6850	010176683
Dry chemical, fire extinguisher	3	00393	4210	007529343
Dry cleaning solvent	15	09110	6850	001104498
Dry cleaning solvent	15	09110	6850	002745421
Dry cleaning solvent	15	09110	6850	006376135
Dry cleaning solvent, PD-680 type III	15	02283		
Dry cleaning solvent, PD-680 type III	15	02283	6850	013313350
Dry cleaning solvent, PD-680 type III	15	02283	6850	013771808
Dry cleaning solvent, PD-680 type III	15	02283	6850	013771809
Dry cleaning solvent, PD-680 type III	15	02283	6850	013771811
Dry cleaning solvent, PD-680 type III	15	02283	6850	013313349
Electrolyte	1	06884	6810	011492805
Electrolyte, 44% to 46% KOH	3	09559		
Emulsan brand polysaccharide bio-polymer	4	11151		
Emulsified oil, dust	11	01751		
Enamel	12	09157	8010	013445321
Enamel	12	09189	8010	013562938
Enamel	12	00401		
Enamel	12	01612	8010	005272053
Enamel	12	01612	8010	005272050
Enamel	12	01612	8010	002867725
Enamel	12	01613	8010	008529033
Enamel	12	01613	8010	002867758
Enamel	12	01613	8010	005272045

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Enamel	12	01613	8010	006167488
Enamel	12	01774	8010	013445108
Enamel	12	01859	8010	009108154
Enamel	12	01901		
Enamel	12	01901	8010	014416147
Enamel	12	01901	8010	014416146
Enamel	12	02050	8010	002854858
Enamel	12	02050	8010	014415909
Enamel	12	02050	8010	002854869
Enamel	12	02131	8010	013445317
Enamel	12	03465		
Enamel	12	03550		
Enamel	12	03567	8010	001490261
Enamel	12	09138	8010	005985929
Enamel	12	10909	8010	013505239
Enamel	12	10910	8010	013966805
Enamel (haze gray)	12	10051	8010	014416450
Enamel (haze gray)	12	10052	8010	014416451
Enamel, red	12	10951	8010	013499006
Enamel, red	12	10951	8010	013966798
Enamel, red	12	10951	8010	013499006
Epoxy coating kit	12	01291	8010	013504744
Epoxy coating kit	12	01293		
Epoxy coating kit	12	01293	8010	009486733
Epoxy coating kit	12	01293	8010	010532652
Epoxy coating kit	12	01294		
Epoxy coating kit	12	01294	8010	010197947
Epoxy coating kit	12	01976		
Epoxy coating kit	12	01976	8010	013023607
Epoxy coating kit	12	01976	8010	013504745
Epoxy coating kit	12	02071		
Epoxy coating kit	12	02071	8010	013802389
Epoxy coating kit	12	02071	8010	013802362
Epoxy coating kit	12	03122	8010	013023606
Epoxy coating kit	12	03123	8010	013023608
Epoxy coating kit	12	03124	8010	013026838
Epoxy coating kit	12	03830	8010	013504741
Epoxy coating kit	12	03831		
Epoxy coating kit	12	03831	8010	013470916
Epoxy coating kit	12	03831	8010	013504742
Epoxy coating kit	12	03832	8010	004108461
Epoxy coating kit	12	09478	8010	014191145
Epoxy Coating Kit	12	10833	8010	013027058
Epoxy coating kit	12	10851	8010	012186560
Epoxy primer coating kit	12	00835	8010	012366971
Epoxy primer coating kit	12	01133	8010	001429279
Epoxy primer coating kit	12	03988	8010	000822450
Epoxy, coating kit	12	10846	8010	013504743

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Ethyl alcohol, technical	15	03177	6810	008238003
Ethylene glycol monoethyl ether,	15	02401	6810	002854309
Ethylene glycol, technical	15	02402	6810	000064205
Extinguisher, fire	5	00408	4210	002030217
Filter cleaning kit	11	11149	2815	014542017
Filter element, fluid	11	10095	4330	014567159
Filter element, fluid	11	10275	4330	012570870
Fluid, coolant	11	09429	9160	013040885
Fluid, recoil	11	02697	1020	004918679
Fluid, transmission	9	10103		
Flux, soldering	6	03693	3439	010699176
Foam liquid, fire extinguishing	3	00444	4210	002239877
Foam liquid, fire extinguishing	3	02581	4210	010568343
Freezing compound	4	01761		
Gasket	16	02725	5330	013922760
Gasket	16	02732	5330	013838032
Gasket	16	03290	5330	002462954
Gasket	16	03328	5330	011091371
Gasket	16	03391	5330	002126290
Gasket	16	03583	5330	011606848
Gasket	16	03583	5330	011606849
Gasket	16	03583	5330	011606850
Gasket	16	11294	5330	013517008
Gasket set	16	03410	5330	008165284
Gasket shellac compound	2	00493	8040	013780235
Gasket, spiral wound	16	03382	5330	013795982
Gasket, spiral wound	16	03389	5330	001864099
Gasoline fuel	19	01648		
Gen-Zyme, drain cleaner	3	10349		
Germicidal solution	7	10230	6505	011562170
Germicidal solution (Advance TBE)	7	11225		
Germicidal solution (Bi-Arrest 2)	7	11224		
Germicidal solution (Confidence Plus)	7	11220		
Germicidal solution (Sanzide Plus)	7	11219		
Glass cleaner	7	01019	7930	009012088
Glass cleaner	15	00516		
Glass cleaner	15	00516	7930	001849423
Glass cleaner	15	00516	7930	006646910
Glass cleaner	15	09832		010533758
Glycerin-water mixture	11	01600	6810	001729098
Glycerol, technical	11	02344	6810	002646548
Graphite, colloidal	11	00538	9150	010206710
Graphite, colloidal	11	01877	9150	009268963
Graphite, dry	11	00539	9620	002336712
Grease	8	00540	9150	003921670
Grease	8	00716		
Grease	8	01750	9150	010410092
Grease	8	09824		00N031804

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Grease lubrication	8	09259	9150	011781221
Grease, aircraft	8	00542		
Grease, aircraft	8	00542	9150	001817724
Grease, aircraft	8	00542	9150	001450268
Grease, aircraft	8	00542	9150	009355851
Grease, aircraft	8	00542	9150	012623358
Grease, aircraft	8	00546	9150	002698255
Grease, aircraft	8	01581	9150	001199291
Grease, aircraft	8	01596	9150	009355851
Grease, aircraft	8	01596	9150	009448953
Grease, aircraft	8	02004	9150	004190628
Grease, aircraft	8	09508	9150	007219490
Grease, aircraft	8	09650	9150	009448953
Grease, aircraft and instrument	8	00549		
Grease, aircraft and instrument	8	00549	9150	009857245
Grease, aircraft and instrument	8	00549	9150	009857246
Grease, aircraft and instrument	8	00549	9150	009857247
Grease, aircraft and instrument	8	00549	9150	009354017
Grease, aircraft and instrument	8	00549	9150	009857244
Grease, aircraft and instrument	8	00549	9150	009857248
Grease, aircraft and instrument	8	00550	9150	001450161
Grease, aircraft and instrument	8	01550	9150	009618995
Grease, aircraft and instrument	8	01550	9150	009618995
Grease, aircraft and instrument	8	01661	9150	010880498
Grease, aircraft and instrument	8	01662	9150	010074384
Grease, aircraft and instrument	8	10324	9150	014419016
Grease, aircraft ordnance	8	00553	9150	005593071
Grease, arresting gear	8	00542	9150	012377468
Grease, automotive	8	09909	9150	011977693
Grease, automotive and artillery	8	00555		
Grease, automotive and artillery	8	00555	9150	011977692
Grease, automotive and artillery	8	00555	9150	011977691
Grease, automotive and artillery	8	00555	9150	011977689
Grease, ball and roller bearing	8	00556		
Grease, ball and roller bearing	8	00556	9150	001416770
Grease, ball and roller bearing	8	00556	9150	008238048
Grease, ball and roller bearing	8	00558		
Grease, ball and roller bearing	8	01596		
Grease, ball and roller bearing	8	01596	9150	001491593
Grease, ball and roller bearing	8	01596	9150	011172928
Grease, ball and roller bearing	8	01596	9150	001491592
Grease, ball and roller bearing	8	01596	9150	013046603
Grease, ball and roller bearing	8	01596	9150	001491593
Grease, ball and roller bearing	8	01596	9150	011172928
Grease, ball and roller bearing	8	09583	9150	011235103
Grease, ball and roller bearing	8	09803	9150	003470471
Grease, food processing equipment	8	03597	9150	012096868
Grease, general purpose	8	00561		

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Grease, general purpose	8	00563		
Grease, general purpose	8	00563	9150	001806381
Grease, general purpose	8	00563	9150	001806383
Grease, general purpose	8	00563	9150	001806382
Grease, general purpose	8	00564		
Grease, general purpose	8	00565		
Grease, general purpose	8	00565	9150	002355555
Grease, general purpose	8	00565	9150	008238047
Grease, general purpose	8	00565	9150	009857316
Grease, general purpose	8	00567	9150	009452249
Grease, general purpose	8	01615		
Grease, general purpose	8	02115	9150	001414481
Grease, general purpose	8	02266	9150	006631770
Grease, general purpose	8	02356		
Grease, general purpose	8	11076	9150	010864163
Grease, general purpose	8	11329	9150	013529706
Grease, graphite	8	00568		
Grease, graphite	8	02753		
Grease, ground glass joint	8	03248	9150	009652408
Grease, high temperature	8	03780	9150	011451259
Grease, lubricating	8	01958		
Grease, Mobil NLGI #2 lithium base	8	10472		
Grease, molybdenum disulfide	8	00575		
Grease, molybdenum disulfide	8	00575	9150	002234004
Grease, molybdenum disulfide	8	00575	9150	009652003
Grease, molybdenum disulfide	8	00575	9150	007542595
Grease, molybdenum disulfide	8	00575	9150	009354018
Grease, molybdenum disulfide	8	00576	9150	009436880
Grease, molybdenum disulfide	8	00578	9150	009857317
Grease, moly-koat g	8	03060		
Grease, ordnance, extreme pressure	8	03228	9150	014680088
Grease, ordnance, extreme pressure	8	03238	9150	006640050
Grease, plug valve	8	02370	9150	002618289
Grease, plug valve	8	02370	9150	002618291
Grease, plug valve	8	02370	9150	002618292
Grease, plug valve	8	00579	9150	002618287
Grease, plug valve	8	00580		
Grease, plug valve	8	00582	9150	002575360
Grease, plug valve	8	01111	9150	007812327
Grease, plug valve	8	10817	9150	002618294
Grease, plug valve	8	10817	9150	002618295
Grease, silicone insulated electric	8	00584	9150	010809652
Grease, special purpose	8	09503	9150	010696857
Grease, water-wash resistant	8	00073	9150	013069167
Grease, wire rope-exposed gear	8	00585	9150	005306814
Greases	8	10681		
Hand cleaner	7	01815	8520	002258563
Hand cleaner	7	03946	8520	009652109

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Hardener, sealing compound	2	11074	8030	011036405
Heat transfer fluid	11	02394	6850	009059098
Helium, technical	5	00639	6830	001690789
Hydraulic fluid, arresting gear	9	09448	9150	002248729
Hydraulic fluid, automatic transmission	9	00664	9150	006982382
Hydraulic fluid, automatic transmission	9	03230	9150	006574959
Hydraulic fluid, automatic transmission	9	05826	9150	010929755
Hydraulic fluid, automatic transmission	9	05826	9150	008431636
Hydraulic fluid, catapult	9	02367		
Hydraulic fluid, catapult	9	02367	9150	010805962
Hydraulic fluid, catapult	9	02367	9150	010805961
Hydraulic fluid, fire resistant	9	00627		
Hydraulic fluid, fire resistant	9	00627	9150	012566433
Hydraulic fluid, fire resistant	9	00627	9150	012642639
Hydraulic fluid, fire resistant	9	00627	9150	012637244
Hydraulic fluid, fire resistant	9	00665		
Hydraulic fluid, fire resistant	9	00665	9150	011132046
Hydraulic fluid, fire resistant	9	00665	9150	011132047
Hydraulic fluid, fire resistant	9	00665	9150	011132045
Hydraulic fluid, fire resistant	9	02847	9150	001497432
Hydraulic fluid, fire resistant	9	02847	9150	001497431
Hydraulic fluid, fire resistant	9	10355	9150	011039411
Hydraulic fluid, noncombustible	9	00666		
Hydraulic fluid, petroleum base	9	00661		
Hydraulic fluid, petroleum base	9	00661	9150	002234134
Hydraulic fluid, petroleum base	9	00661	9150	000827524
Hydraulic fluid, petroleum base	9	00661	9150	002659408
Hydraulic fluid, petroleum base	9	00661	9150	002526383
Hydraulic fluid, petroleum base	9	00670		
Hydraulic fluid, petroleum base	9	00670	9150	002904091
Hydraulic fluid, petroleum base	9	00670	9150	002618318
Hydraulic fluid, petroleum base	9	00670	9150	002618317
Hydraulic fluid, petroleum base	9	00779		
Hydraulic fluid, petroleum base	9	00779	9150	009857234
Hydraulic fluid, petroleum base	9	00779	9150	005825480
Hydraulic fluid, petroleum base	9	00779	9150	007534799
Hydraulic fluid, petroleum base	9	00816		
Hydraulic fluid, petroleum base	9	00816	9150	012637243
Hydraulic fluid, petroleum base	9	00816	9150	012638427
Hydraulic fluid, petroleum base	9	00824		
Hydraulic fluid, petroleum base	9	00824	9150	009857232
Hydraulic fluid, petroleum base	9	00824	9150	009857233
Hydraulic fluid, petroleum base	9	00824	9150	009857231
Hydraulic fluid, petroleum base	9	00828		
Hydraulic fluid, petroleum base	9	00828	9150	009857237
Hydraulic fluid, petroleum base	9	00828	9150	005842560
Hydraulic fluid, petroleum base	9	00828	9150	009857236
Hydraulic fluid, petroleum base	9	02854	9150	009359809

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Hydraulic fluid, petroleum base	9	10922	9150	014412863
Hydraulic fluid, power steering	9	09871	9150	010872234
Hydraulic oil	9	11214	9150	011692789
Hydraulic oil	9	11221		
Hydrochloric acid, technical	1	02662	6810	002229641
Hydrogen peroxide, topical solution	18	09572	6506	001538480
Inhibitor, corrosion	6	09234	6850	014139361
Inhibitor, corrosion	17	09182	6850	012871057
Inhibitor, corrosion, liquid cooling	6	03971	6850	011603868
Inhibitor, corrosion, liquid cooling	6	03971	6850	011603867
Inhibitor, corrosion, liquid cooling	6	00683	6850	001395319
Inhibitor, corrosion, liquid cooling	6	02835		
Inhibitor, corrosion, liquid cooling	6	02835	6850	010863438
Inhibitor, corrosion, liquid cooling	6	02835	6850	010854717
Inhibitor, corrosion, liquid cooling	6	02835	6850	010854718
Inhibitor, corrosion, liquid cooling	6	03751		
Inhibitor, corrosion, vapor barrier	6	01816	6850	003685233
Inhibitor, corrosion, vapor barrier	6	09122	6850	013381392
Inhibitor, corrosion, vapor barrier	6	09123	6850	014089025
Inhibitor, corrosion, vapor barrier	6	09124	6850	014062060
Inhibitor, corrosion, water soluble	6	08988	6850	013629256
Inspection penetrant developer, dry	10	03795	6850	012410651
Insulating compound, electrical	12	00999	5970	002415406
Insulating compound, electrical	12	03973	5970	011483397
Insulating compound, electrical	12	01570	5970	002959298
Insulating compound, electrical	12	02327	5970	002336239
Insulating compound, electrical	12	02449	5970	010138611
Insulating oil, electrical	11	00691	9160	006850913
Insulating varnish, electrical	12	01620	5970	009623335
Insulating varnish, electrical	12	02637	5970	005830401
Insulating varnish, electrical	12	02637	5970	001617422
Iodophor/disinfectant	7	01551		
Ion exchange compound	17	02452	6810	005593267
Ion exchange compound	17	03444	6810	008732554
Ion exchange compound	17	05671	6810	010294217
Ion exchange compound	17	05671	6810	010294217
Isopropyl alcohol, acs	15	00699	6810	002270410
Isopropyl alcohol, technical	15	00700		
Isopropyl alcohol, technical	15	00700	6810	008556160
Isopropyl alcohol, technical	15	00700	6810	011902538
Isopropyl alcohol, technical	15	00701		
Isopropyl alcohol, technical	15	00701	6810	009838551
Isopropyl alcohol, technical	15	00701	6810	002865435
Isopropyl alcohol, technical	15	00701	6810	007534993
Isopropyl alcohol, usp	15	00698		
Isopropyl alcohol, usp	15	00698	6505	002998095
Isopropyl alcohol, usp	15	00698	6505	002617256
JP-5 Fuel (Aviation)	19	01647		

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
KCl solution	3	03962		
Kerosene	19	02698	9140	002426748
Kit, cleaning	4	03771	6850	012019864
Kit-penetrant inspection	10	01980		
Lacquer	12	03568	8010	006639434
Lacquer	12	03791	8010	001711509
Lacquer	12	03793	8010	002482839
Lapping and grinding compound	14	00744	5350	001931341
Lapping and grinding compound	14	00745	5350	005761687
Lapping and grinding compound	14	00746	5350	001931348
Lapping and grinding compound	14	00742	5350	001937227
Lapping and grinding compound	14	00748	5350	001931356
Layout dye	10	03731	6850	010139937
Layout dye	10	00749	6850	006649067
Leak detector, refrigerant gas	7	01678	4940	008250198
Leak test compound	7	00754	6850	006211820
Leak test compound	7	02405	6850	006211819
Leak test compound	7	09246	6850	013960159
Leak test compound	7	09248	6850	013960163
Linseed oil, raw	14	00766	5350	002210611
Lithium bromide charge	18	02569	6810	007978619
Lithium hydroxide, technical	3	02576	6810	005593261
Lub oil, shpbd rcpig air compressor	11	01592		
Lubricant	11	01553	9150	009357127
Lubricant	11	02640	1040	000896295
Lubricant	11	03239	9150	009944539
Lubricant	11	03655	9150	011592203
Lubricant	11	10250	1386	012782163
Lubricant, aluminum	11	03246	9150	010127533
Lubricant, chain and cable spray	11	09509	9150	011932020
Lubricant, fluorocarbon	11	02672	9150	014439003
Lubricant, fluoro-si	11	09794	9150	002481734
Lubricant, gearcase	11	09891		
Lubricant, solid	11	02308	9150	009681444
Lubricant, solid film	11	01552	9150	009487025
Lubricant, solid film	11	00777	9150	012602534
Lubricant, solid film	11	00777	9150	009547422
Lubricant, solid film	11	00834	9150	012326884
Lubricant, solid film	11	00940	9150	012602534
Lubricant, solid film	11	02323	9150	013601907
Lubricant, solid film	11	02464	9150	009857255
Lubricant, starter pinion	11	09889		
Lubricant, stick form	11	02364	9150	000687862
Lubricating compound	11	02521	9150	004826884
Lubricating compound	11	01651		
Lubricating compound	11	02341	9150	010489394
Lubricating compound, dimethylsil	11	01749	9150	008237860
Lubricating fluid, oxidizing gas	11	02617	9150	011018836

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Lubricating fluid, oxidizing gas	11	02623	9150	011018836
Lubricating fluid, oxidizing gas	11	02623	9150	011018835
Lubricating fluid, oxidizing gas	11	02623	9150	011018834
Lubricating kit	11	03237	9150	010416648
Lubricating oil	11	09099	9150	014108972
Lubricating oil	11	01733	9150	005297222
Lubricating oil, air compressor	11	00821	9150	009652399
Lubricating oil, air compressor	11	03231	9150	011025020
Lubricating oil, air compressor	11	09505	9150	010997155
Lubricating oil, air compressor	11	10122	9150	013332517
Lubricating oil, aircraft piston	11	09093	9150	002359059
Lubricating oil, aircraft piston	11	00772		
Lubricating oil, aircraft piston	11	00772	9150	009652303
Lubricating oil, aircraft piston	11	00783	9150	007535060
Lubricating oil, aircraft piston engine	11	00772	9150	000195701
Lubricating oil, aircraft turbine	11	00782	9150	002738807
Lubricating oil, aircraft turbine	11	02821	9150	001085359
Lubricating oil, aircraft turboshaft	11	00781	9150	009857099
Lubricating oil, aircraft turboshaft	11	00781	9150	006815999
Lubricating oil, aircraft turboshaft	11	00781	9150	001806266
Lubricating oil, colloidal graphite	11	00785	9150	002355581
Lubricating oil, colloidal graphite	11	01563	9150	002355584
Lubricating oil, compounded	11	00786	9150	002316646
Lubricating oil, compounded	11	00787	9150	000115892
Lubricating oil, compounded	11	00788	9150	002316662
Lubricating oil, compounded	11	00789	9150	002316661
Lubricating oil, compounded	11	01565		
Lubricating oil, engine	11	09755	9150	001912772
Lubricating oil, engine	11	00080	9150	013186008
Lubricating oil, engine	11	00791	9150	001866681
Lubricating oil, engine	11	00793	9150	001113199
Lubricating oil, engine	11	00794	9150	001110209
Lubricating oil, engine	11	00795		
Lubricating oil, engine	11	00795	9150	001818229
Lubricating oil, engine	11	00795	9150	001818097
Lubricating oil, engine	11	00849	9150	001178791
Lubricating oil, engine	11	01572	9150	001896727
Lubricating oil, engine	11	01572	9150	001866668
Lubricating oil, engine	11	02666	9150	012781357
Lubricating oil, engine	11	02724	9150	011524117
Lubricating oil, engine	11	03249	9150	011784726
Lubricating oil, exposed gear	11	09094	9150	013987341
Lubricating oil, exposed gear	11	00778	9150	002345199
Lubricating oil, exposed gear	11	02846	9150	009354127
Lubricating oil, food processing	11	03580	9150	012377980
Lubricating oil, food processing	11	03581	9150	012377467
Lubricating oil, gear	11	00801		
Lubricating oil, gear	11	00801	9150	002234130

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Lubricating oil, gear	11	00801	9150	002234116
Lubricating oil, gear	11	00802		
Lubricating oil, gear	11	00802	9150	010355395
Lubricating oil, gear	11	00802	9150	010484591
Lubricating oil, gear	11	00803		
Lubricating oil, gear	11	00808	9150	002402235
Lubricating oil, gear	11	01598		
Lubricating oil, gear	11	01598	9150	010355393
Lubricating oil, gear	11	01598	9150	010355392
Lubricating oil, gear	11	01598	9150	013132191
Lubricating oil, gear	11	02652	9150	010355390
Lubricating oil, gear	11	03713	9150	011499166
Lubricating oil, gear	11	03979	9150	013306167
Lubricating oil, gear	11	09504	9150	013446628
Lubricating oil, gear	11	10104	9150	014204478
Lubricating oil, gear	11	11121	9150	014140615
Lubricating oil, general purpose	11	00814		
Lubricating oil, general purpose	11	00811		
Lubricating oil, general purpose	11	00812		
Lubricating oil, general purpose	11	00817		
Lubricating oil, general purpose	11	00817	9150	002618146
Lubricating oil, general purpose	11	00817	9150	008368641
Lubricating oil, general purpose	11	00817	9150	002319045
Lubricating oil, general purpose	11	00819		
Lubricating oil, general purpose	11	00819	9150	005421430
Lubricating oil, general purpose	11	00819	9150	002633490
Lubricating oil, general purpose	11	00823		
Lubricating oil, general purpose	11	00823	9150	002312361
Lubricating oil, general purpose	11	00823	9150	002718427
Lubricating oil, general purpose	11	00823	9150	002312356
Lubricating oil, general purpose	11	00831		
Lubricating oil, general purpose	11	00831	9150	004580075
Lubricating oil, general purpose	11	00831	9150	002732389
Lubricating oil, general purpose	11	00831	9150	002812060
Lubricating oil, general purpose	11	00831	9150	002319062
Lubricating oil, general purpose	11	00831	9150	002316689
Lubricating oil, general purpose	11	02620	9150	012063626
Lubricating oil, hydraulic	11	01762	9150	000825636
Lubricating oil, hydraulic	11	09523	9150	010719915
Lubricating oil, instrument	11	00836	9150	002355590
Lubricating oil, instrument	11	00839		
Lubricating oil, instrument	11	00839	9150	006646518
Lubricating oil, instrument	11	00839	9150	002575449
Lubricating oil, instrument	11	00839	9150	002234129
Lubricating oil, instrument	11	01573	9150	001817314
Lubricating oil, instrument	11	03464	9150	004555361
Lubricating oil, instrument	11	10204	9150	012615921
Lubricating oil, mineral	11	00805		

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Lubricating oil, mineral, steam cylinder	11	00840	9150	002402260
Lubricating oil, molybdenum disul	11	02618	9150	004243224
Lubricating oil, molybdenum disulfide	11	00841	9150	005437220
Lubricating oil, pneumatic tool	11	09546	9150	011802295
Lubricating oil, preservative	11	02688	9150	008893523
Lubricating oil, pump	11	03244	9150	010174704
Lubricating oil, refrigerant	11	09907	9150	014439390
Lubricating oil, refrigerant	11	09908	9150	014439396
Lubricating oil, refrigerant	11	11052	9150	015023689
Lubricating oil, refrigerant	11	11075	9150	015028462
Lubricating oil, refrigerant compressor	11	00843		
Lubricating oil, refrigerant compressor	11	00844		
Lubricating oil, refrigerant compressor	11	00844	9150	006644447
Lubricating oil, refrigerant compressor	11	00844	9150	008237905
Lubricating oil, refrigerant compressor	11	03019	9150	005982911
Lubricating oil, refrigerant compressor	11	03019	9150	002929657
Lubricating oil, semifluid	11	00846	9150	006874241
Lubricating oil, semifluid	11	00846	9150	008893522
Lubricating oil, semifluid	11	00975	9150	009490323
Lubricating oil, special	11	03965	9150	010083336
Lubricating oil, steam turbine	11	00620		
Lubricating oil, steam turbine	11	00620	9150	012637241
Lubricating oil, steam turbine	11	00620	9150	012637240
Lubricating oil, steam turbine	11	00620	9150	012637239
Lubricating oil, steam turbine	11	00620	9150	012637242
Lubricating oil, steam turbine	11	00848		
Lubricating oil, steam turbine	11	00848	9150	013687075
Lubricating oil, steam turbine	11	00848	9150	013687076
Lubricating oil, steam turbine	11	00848	9150	002359064
Lubricating oil, steam turbine	11	00848	9150	013702583
Lubricating oil, steam turbine	11	01693	9150	002359062
Lubricating oil, two-cycle engine	11	02621		
Lubricating oil, vacuum pump	11	02395	9150	002738663
Lubricating oil, watch	11	00850	9150	002526382
Lubricating oil, weapons	11	01280	9150	002929689
Lubricating oil, weapons	11	10816	9150	011045227
Lubricating, oil	11	09804	7150	013519017
Lubrication kit, photographic	13	05611	9150	010143512
Lubrication kit, steering cable	11	01017	5180	013176092
Lubrication oil, engine	11	09220	9150	011524118
Lubrication oil, engine	11	09221	9150	011524119
Lubrication oil, refrigerant compressor	11	09512	9150	014351899
Lubrication oil, refrigerant compressor	11	09587		
Lubrication oil, refrigerant compressor	11	09588		
Magnesium chloride	17	10069	6810	002270411
Mercury, acs	20	03303	6810	002817452
Mercury, acs	20	03304	6810	002817453
Mercury, acs	20	03305	6810	002817450

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Methanol, technical	15	00887	6810	005973608
Methyl ethyl ketone, technical	15	03533		
Methyl ethyl ketone, technical	15	03533	6810	006878429
Methyl ethyl ketone, technical	15	03533	6810	002812785
Methyl ethyl ketone, technical	15	03533	6810	002812762
Methyl ethyl ketone, technical	15	03533	6810	002648983
Methyl purple alkalinity indicator	17	03784	6810	012598231
Mineral oil, usp	11	02416	6505	001336000
Module chgr assy battery	21	10109	6130	014718418
Molybdenum disulfide, technical	8	00894	6810	008161025
Monoethanolamine-chelating	3	02350	6810	009589970
Naphtha, aliphatic	15	00274	6810	002388119
Naphtha, aromatic	15	00905	6810	002011316
N-Dodecane	19	10807	6810	014192677
Neat's-foot oil	11	00906	8030	002441031
Nitric acid, acs	1	03969	6810	007534779
Nitric acid, reagent	1	03757	6810	002709978
Nitric acid, technical	1	02454	6810	002229655
Nitrogen, liquid	5	10519		
Nitrogen, technical	5	00915	6830	002442741
Nitrogen, technical	5	02834	6830	010403847
Nitrogen, technical	5	03736	6830	007586475
Oil	11	01977		
Oil, Royco 757	11	11440		
Orthophosphoric acid, technical	1	00936	6810	002646722
Oxygen, aviator breathing	5	11060	6830	011694836
Oxygen, aviator's breathing	5	11217	6830	007822639
Packing	16	02731		
Packing	16	02745		
Packing assembly	16	03313	5330	014577607
Packing material	16	02729	5330	006183222
Packing material	16	02736	5330	001861743
Packing material	16	02737	5330	006183221
Packing material	16	02739	5330	014676105
Packing material	16	02740	5330	006183226
Packing material	16	02741	5330	001979654
Packing material	16	02742	5330	001861747
Packing material	16	02743	5330	006183223
Packing material	16	02744	5330	014182865
Packing material	16	02746	5330	006183225
Packing material	16	02747	5330	012333043
Packing material	16	02748	5330	014157775
Packing material	16	02998	5330	013888456
Packing material	16	03196	5330	002689879
Packing material	16	03197	5330	002689880
Packing material	16	03262	5330	001861749
Packing material	16	03267	5330	001978524
Packing material	16	03268	5330	001978529

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Packing material	16	03270	5330	001978535
Packing material	16	03271	5330	001979647
Packing material	16	03272	5330	001979655
Packing material	16	03273	5330	001979673
Packing material	16	03312	5330	012070619
Packing material	16	03318	5330	005277493
Packing material	16	03319	5330	005277495
Packing material	16	03320	5330	005277503
Packing material	16	03337	5330	000050521
Packing material	16	03338	5330	000062532
Packing material	16	03340	5330	001979641
Packing material	16	03341	5330	001979658
Packing material	16	03343	5330	014386757
Packing material	16	03344	5330	000382922
Packing material	16	03346	5330	001978493
Packing material	16	03348	5330	001978528
Packing material	16	03349	5330	001978530
Packing material	16	03350	5330	001978536
Packing material	16	03351	5330	004503975
Packing material	16	03353	5330	001978542
Packing material	16	03355	5330	002629437
Packing material	16	03357	5330	004503894
Packing material	16	03361	5330	014710285
Packing material	16	03380	5330	005596120
Packing material	16	03384	5330	014710288
Packing material	16	03436	5330	002629439
Packing material	16	04335	5330	001909978
Packing material	16	06652	5330	001718766
Packing, preformed	16	03395	5330	002494893
Packing, preformed	16	03396	5330	002510513
Pad, isopropyl alcohol impregnate	15	00098	6510	007863736
Paint primer, light gray quick dry	12	10074		
Paint thinner	12	10075		
Paint, conductive, copper	12	03069	8010	012898318
Paint, enamel	12	10113	8010	014621370
Paint, enamel, black	12	10485	8010	013445114
Paint, enamel, haze gray	12	10483	8010	014713275
Paint, enamel, red	12	10482	8010	014621369
Paint, enamel, yellow	12	10484	8010	014621364
Paint, general purpose	12	00957		
Paint, heat resisting	12	00958	8010	008152692
Paint, navy gray	12	10073		
Penetrating fluid	11	00979	6850	009739091
Penetrating fluid	11	02586	6850	010438511
Penetrating oil	11	09754	9150	009051387
Penetrating oil	11	00980	9150	002617899
Petrolatum, liquid, technical	11	01685		
Petrolatum, technical	11	00982		

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Petrolatum, technical	11	00982	9150	002500933
Petrolatum, technical	11	00982	9150	002500926
Petroleum oil, white	11	03253	9150	001376344
Ph indicator solution	17	02252	6810	006641622
Phenolphthalein, acs	17	00986	6810	002237612
Phosphoric acid, acs	1	02615	6810	007534777
Picture pack, rapid processing, photo	13	10959	6135	012511430
Pigment, paint products	11	01431	8010	002395736
Pigment, paint products	12	02388	8010	006641414
Plating solution additive, silver	3	02029	6850	005610349
Polish, automobile	14	02034	7930	007218873
Polish, metal	14	01047		
Polish, metal	14	01045		
Polish, metal	14	01046		
Polish, metal	14	01046	7930	002667137
Polish, metal	14	01046	7930	002667136
Polish, metal	14	01048	7930	002667135
Polish, photoreceptor	14	09699	6850	010988745
Polish, plastic	14	01049	7930	009353794
Polyurethane coating	12	00605	8010	004825651
Polyurethane coating	12	01132	8010	010683115
Polyurethane coating	12	03869	8010	013226624
Polyurethane coating	12	03989	8010	001818281
Polyurethane coating	12	09394	8010	014133633
Potassium carbonate	3	02240	6810	004995825
Potassium dihydrogen phosphate	17	10070	6810	002921121
Potassium hydroxide solution	3	01051	6810	002812029
Potassium hydroxide solution	3	05275	6810	008507787
Povidone-iodine cleansing solution	7	00367	6505	009947224
Preservative coating, rubber	12	03708	8030	012223252
Preservative coating, rubber	12	09462	8030	013142213
Preservative, compound	6	03448	8030	011032868
Pretreatment coating	1	01655		
Primer coating	12	03515		
Primer coating	12	09536	8010	014391311
Primer coating	12	00837	8010	005152208
Primer coating	12	01118	8010	012851329
Primer coating	12	02122	8010	013682633
Primer coating	12	02123	8010	012851328
Primer coating	12	02125	8010	013871069
Primer coating	12	02300	8010	001697082
Primer coating	12	03646		
Primer, adhesive	2	03837	8040	012500288
Primer, adhesive	2	03188	8040	000838403
Primer, coating	12	01062		
Primer, coating	12	02051		
Primer, coating compound	12	02346	8030	001376129
Primer, electric and percussion	12	02469	1390	007267457

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Primer, sealing compound	2	03976	8030	000822508
Primer, sealing compound	2	00830	8030	009002373
Primer, sealing compound	2	02420	8030	001818372
Primer, sealing compound	2	11126	8030	013885604
Propane cartridge	5	11194	6830	013208823
Propylene glycol, technical	15	10978	6810	011817121
Putty	16	03438	8030	001450300
Quick clean degreaser	4	10713		
ReAct kit structural acrylic	2	10929	8040	014991663
Reaction agent	17	03518	6665	008780489
Remover, paint	15	01113		
Remover, paint	15	03493	8010	001817568
Remover, paint	15	03985	8010	001605799
Remover, paint	15	03985	8010	005978234
Remover, paint	15	10481	8010	014344696
Repair kit, diving equipment	2	01996	4220	006941410
Rinse additive, dishwashing	7	02055	7930	010460163
Scale prevention compound	1	03658	6850	011504921
Scale removing compound	1	01148	6850	006376142
Scale removing compound	1	10191	6850	014578789
Scale removing compound	1	11195	6850	009491397
Scouring powder	4	01154	7930	012941116
Sealant, tough guard	14	11023	0099	LLH563629
Sealing compound	2	10258	8030	012863924
Sealing compound	2	10892	8030	014944135
Sealing compound	2	00041	8030	011633483
Sealing compound	2	00264	8030	002512312
Sealing compound	2	00548	8030	011329623
Sealing compound	2	00755	8030	009996313
Sealing compound	2	00998	8030	010693046
Sealing compound	2	00998	8030	010556126
Sealing compound	2	00998	8030	010543968
Sealing compound	2	01219	8030	000812331
Sealing compound	2	01219	8030	009004412
Sealing compound	2	01219	8030	000812330
Sealing compound	2	01221	8030	005844399
Sealing compound	2	01223	8030	000812341
Sealing compound	2	01223	8030	010139503
Sealing compound	2	01223	8030	000812340
Sealing compound	2	01227	8030	005152251
Sealing compound	2	01228	8030	002460931
Sealing compound	2	01229	8030	002643888
Sealing compound	2	01230	8030	002460933
Sealing compound	2	01232		
Sealing compound	2	01232	8030	008490071
Sealing compound	2	01232	8030	002523391
Sealing compound	2	01233	8030	000812328
Sealing compound	2	01233	8030	000812329

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Sealing compound	2	01234		
Sealing compound	2	01234	8030	002206973
Sealing compound	2	01234	8030	006561426
Sealing compound	2	01470	8030	003126128
Sealing compound	2	01579	8030	000087207
Sealing compound	2	01590	8030	000812339
Sealing compound	2	01590	8030	000812338
Sealing compound	2	01590	8030	000676744
Sealing compound	2	01591	8030	000819022
Sealing compound	2	01591	8030	004561038
Sealing compound	2	01591	8030	000812335
Sealing compound	2	01690	8030	006827450
Sealing compound	2	01860	8030	011549255
Sealing compound	2	02144	8030	001806222
Sealing compound	2	02147	8030	011660675
Sealing compound	2	02421	8030	000812327
Sealing compound	2	02429	8030	013846607
Sealing compound	2	03582	8030	007232746
Sealing compound	2	03614	8030	000812333
Sealing compound	2	03614	8030	008237917
Sealing compound	2	03614	8030	009647537
Sealing compound	2	03665	8030	010251692
Sealing compound	2	03759	8030	007628807
Sealing compound	2	03772	8030	002049149
Sealing compound	2	03841	8030	000095023
Sealing compound	2	03842	8030	001047747
Sealing compound	2	03916	8030	000087198
Sealing compound	2	03967	8030	010482087
Sealing compound	2	09137	8030	000637176
Sealing compound	2	09758	8030	011045392
Sealing compound	2	09795	8030	000641075
Sealing compound	2	09855	8030	011376964
Sealing compound	2	09873	8030	013138827
Sealing compound	2	10111	8030	002472525
Sealing compound	2	10112	8030	011840328
Sealing Compound	2	10487	8030	014437388
Sealing compound	2	10886	8030	010249584
Sealing compound	2	10941	8030	010145869
Sealing compound	2	11045	8030	014457580
Sealing compound	2	11122	8030	010139306
Sealing compound	2	11127	8030	011423131
Sealing compound	2	11318	8030	010668156
Sealing compound	2	11435	8030	000812336
Sealing, compound	2	11117	8030	013336730
Shellac, cut	15	01247	8010	001654761
Silicone compound	11	01254	6850	009635402
Silicone compound	11	01255	6850	006644959
Silicone compound	11	01257	6850	009750712

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Silicone compound	11	01258	6850	007024297
Silicone compound	11	01259		
Silicone compound	11	01259	6850	001775094
Silicone compound	11	01259	6850	008807616
Silicone compound	11	01259	6850	002957685
Silicone compound	11	00761	6850	002940860
Silicone compound	11	01584		
Silicone compound	11	01694	6850	009279461
Silicone compound	11	03254		
Silicone compound	11	03844		
Silicone compound	11	03844	6850	004431183
Silicone compound	11	03844	6850	010463643
Soap, ivory	7	10880	8520	011338099
Soap, laundry	7	01267	7930	009654868
Soap, laundry	7	02788	7930	006343935
Soap, laundry	7	02788	7930	009265262
Soap, toilet	7	02295	8520	005316484
Soda lime, reagent	3	10852	6810	011130110
Soda lime, reagent	3	11266	6810	013585122
Sodium bicarbonate, anhydrous, technical	3	09531	6810	002411099
Sodium bicarbonate, technical	3	01297	6810	002646618
Sodium carbonate, anhydrous, technical	17	00643	6810	002331715
Sodium chromate, anhydrous, technical	17	01299	6810	002402119
Sodium hydroxide	3	10068	6810	002010909
Sodium hydroxide, technical	3	02442	6810	002708177
Sodium hypochlorite solution	13	03618	6810	005987316
Sodium metasilicate, anhydrous, technical	3	02304	6810	006647062
Sodium phosphate, dibasic	3	03742	6810	005844298
Sodium phosphate, dibasic, anhydrous	3	01304	6810	002646630
Sodium phosphate, tribasic, anhydrous	3	01302	6810	001416080
Sodium phosphate, tribasic, anhydrous	3	03056	6810	001416078
Sodium thiosulfate (crystals)	17	10063	6810	002348380
Solder, lead alloy	20	01305	3439	010749983
Solder, tin alloy	20	01307	3439	002699610
Standard chloride solution	17	02060	6810	011293762
Standard conductivity	17	01320	6810	009457682
Standard hardness solution	17	02061	6810	011255234
Sulfamic acid, technical	1	00711	6810	012369402
Tetrachloroethylene, technical	15	09869	6810	010132541
Thermometer, indicating, capillary	20	01386	6685	003377180
Thermometer, self-indicating	20	03083	6685	000519480
Thermometer, self-indicating	20	03590	6685	004444000
Thermometer, self-indicating	20	03635	6685	008411439
Thermometer, self-indicating, liquid	20	00104	6685	002559981
Thermometer, self-indicating, liquid	20	01385	6685	002439964
Thermometer, self-indicating, liquid	20	02386	6685	008944516
Thermometer, self-indicating, liquid	20	02387	6685	008944515
Thinner, paint products	15	01389	8010	002422089

NAME	HMUG GROUP #	SPMIG/ SPIN	FSC	NIIN
Thinner, paint products	15	01674	8010	001605788
Thinner, paint products	15	03456	8010	001605787
Toluene, technical	15	01391		
Toluene, technical	15	01391	6810	002900046
Toluene, technical	15	01391	6810	002900048
Topcoat	12	09535	8010	014379662
Trichloroethane, technical	15	00001	6810	009306311
Trichloroethane, technical	15	00003	6810	006640387
Trichlorotrifluoroethane, technical	15	02461	6830	005842957
Vapor capsules, corrosion inhibited	6	11421	4440	014759949
Vapor capsules, corrosion inhibiting	6	10183	4440	014813150
Varnish, asphalt	12	01911	8010	002990214
Varnish, oil	12	01418	8010	001806343
Vinegar	1	01895	8950	010793978
Water displacing compound	15	09748	6850	001429409
Water indicating paste	10	02054	6850	000014194
Water sampling test reagent	17	10060	6630	013575910
Water sampling test reagent	17	10061	6630	013628299
Water-displacing compound	4	03974	6850	001429389
Wax, aircraft	14	03570	7930	013232005
Wax, gasket sealing	14	02347	9160	005264159
Wax, general purpose, solvent type	14	01428	7930	005308374
Wax, paraffin, technical	14	03472	9160	002852048
Xylene, technical	15	02635	6810	005986600
Zinc oxide paste, USP	11	09926	6505	001502500

APPENDIX C
STANDARD PMS ITEM NAME (SPIN) TO GROUP INDEX

SPIN	NAME	GROUP #	FSC	NIIN
00001	Trichloroethane, technical	15	6810	9306311
00002	Battery, nonrechargeable	21	6135	738939
00003	Trichloroethane, technical	15	6810	6640387
00006	Acetone, technical	15	6810	2232739
00006	Acetone, technical	15	6810	1844796
00018	Adhesive	2	8040	5731502
00019	Adhesive	2	8040	2738707
00019	Adhesive	2	8040	2738708
00029	Adhesive	2	8040	8658991
00030	Adhesive	2	8040	1450020
00030	Adhesive	2	8040	1449774
00032	Adhesive	2	8040	1450075
00033	Adhesive	2	8040	2629031
00033	Adhesive	2	8040	2629028
00033	Adhesive	2	8040	2811972
00033	Adhesive	2	8040	2629026
00033	Adhesive	2	8040	2629025
00038	Alcohol, denatured	15	6810	2010906
00038	Alcohol, denatured	15	6810	5437415
00038	Alcohol, denatured	15	6810	2010907
00038	Alcohol, denatured	15	6810	2010904
00039	Alcohol	15	6505	1049000
00041	Sealing compound	2	8030	11633483
00042	Adhesive	2	8040	5152246
00043	Cartridge, carbon dioxide	5	4220	3720585
00053	Antifreeze	15	6850	14413218
00053	Antifreeze	15	6850	14413221
00053	Antifreeze	15	6850	14413223
00053	Antifreeze	15	6850	13834068
00054	Antiseize compound	8	8030	2433285
00054	Antiseize compound	8	8030	878630
00055	Antiseize compound	8	8030	2921102
00058	Antiseize compound	8	8030	10445034
00059	Antiseize compound	11	8030	2513980
00059	Antiseize compound	11	8030	592761
00059	Antiseize compound	11	8030	2865453
00059	Antiseize compound	11	8030	5975367
00062	Antiseize compound	8	8030	8314171
00062	Antiseize compound	8	8030	12755050
00073	Grease, water-wash resistant	8	9150	13069167
00080	Lubricating oil, engine	11	9150	13186008
00091	Battery, nonrechargeable	21	6135	13065880

SPIN	NAME	GROUP #	FSC	NIIN
00093	Calcium hypochlorite, technical	18	6810	2550471
00093	Calcium hypochlorite, technical	18	6810	2424770
00093	Calcium hypochlorite, technical	18	6810	2388115
00098	Pad, isopropyl alcohol impregnate	15	6510	7863736
00099	Dispersant	15	6850	10176683
00104	Thermometer, self-indicating, liquid	20	6685	2559981
00111	Battery, nonrechargeable	21	6135	9857846
00134	Boiler water testing kit	17	6630	3720839
00147	Brake fluid, automotive	9	9150	1900932
00147	Brake fluid, automotive	9	9150	2319071
00237	Carbon removing compound	4	6850	5437801
00237	Carbon removing compound	4	6850	5507453
00241	Cleaning compound, solvent	15	6850	338851
00241	Cleaning compound, solvent	15	6850	3190834
00241	Cleaning compound, solvent	15	6850	6815688
00241	Cleaning compound, solvent	15	6850	9351082
00241	Cleaning compound, solvent	15	6850	12690513
00242	Cement, insulation, high temperature	2	5640	2264540
00254	Chloride solution	17		
00256	Citric acid, monohydrate, acs	1	6810	2812014
00264	Sealing compound	2	8030	2512312
00274	Naphtha, aliphatic	15	6810	2388119
00275	Cleaning compound, solvent	15	6850	9830282
00276	Cleaning compound, windshield	15	6850	9262275
00278	Cleaning compound, aircraft surface	4		
00279	Cleaning compound, elec contact	4	6850	6645640
00280	Cleaning compound, optical lens	15	6850	2271887
00280	Cleaning compound, optical lens	15	6850	3929751
00282	Cleaning compound, rifle bore	4	6850	2246657
00282	Cleaning compound, rifle bore	4	6850	7534806
00282	Cleaning compound, rifle bore	4	6850	2246663
00282	Cleaning compound, rifle bore	4	6850	2246656
00284	Cleaning compound, solvent	15	6850	9652359
00284	Cleaning compound, solvent	15	6850	9652360
00285	Cleaning compound, solvent	15	6850	9652331
00285	Cleaning compound, solvent	15	6850	5592836
00299	Coating compound, metal pretreatment	1	8030	1658577
00299	Coating compound, metal pretreatment	1	8030	5359780
00312	Corrosion preventive compound	6	8030	2728530
00312	Corrosion preventive compound	6	8030	2642063
00318	Corrosion preventive compound	6		
00318	Corrosion preventive compound	6	8030	2312345
00318	Corrosion preventive compound	6	8030	2441300
00318	Corrosion preventive compound	6	8030	2441299
00318	Corrosion preventive compound	6	8030	626950

SPIN	NAME	GROUP #	FSC	NIIN
00319	Corrosion preventive compound	6	8030	2133279
00321	Corrosion preventive compound	6	8030	8376557
00321	Corrosion preventive compound	6	8030	2441293
00321	Corrosion preventive compound	6	8030	2441296
00321	Corrosion preventive compound	6	8030	2441294
00322	Corrosion preventive compound	6	8030	9381947
00324	Corrosion preventive compound	6		
00324	Corrosion preventive compound	6	8030	2441297
00324	Corrosion preventive compound	6	8030	2441295
00324	Corrosion preventive compound	6	8030	2441298
00328	Corrosion remover	6	6850	10283063
00331	Corrosion resistant coating, chemical	6	8030	6233180
00331	Corrosion resistant coating, chemical	6	8030	8113723
00349	Cutting fluid	11		
00349	Cutting fluid	11	9150	2345198
00349	Cutting fluid	11	9150	2526380
00349	Cutting fluid	11	9150	2618144
00351	Cylinder, compressed gas, carbon dioxide	5	8120	1818082
00354	Damping fluid	11	9150	2698246
00358	Desiccant, activated	17		
00358	Desiccant, activated	17	6850	2646568
00358	Desiccant, activated	17	6850	2646562
00358	Desiccant, activated	17	6850	2646574
00358	Desiccant, activated	17	6850	2646571
00358	Desiccant, activated	17	6850	2646572
00358	Desiccant, activated	17	6850	2646573
00359	Desiccant, activated	17	6850	2900042
00362	Detergent, general purpose	7		
00362	Detergent, general purpose	7	7930	5319715
00362	Detergent, general purpose	7	7930	5319716
00363	Detergent, laundry	7		
00363	Detergent, laundry	7	7930	9291220
00363	Detergent, laundry	7	7930	9907391
00363	Detergent, laundry	7	7930	13126389
00365	Detergent, general purpose	7		
00365	Detergent, general purpose	7	7930	1775243
00365	Detergent, general purpose	7	7930	3577386
00365	Detergent, general purpose	7	7930	681669
00365	Detergent, general purpose	7	7930	9265280
00366	Detergent, general purpose	7		
00366	Detergent, general purpose	7	7930	2829700
00366	Detergent, general purpose	7	7930	2829699
00366	Detergent, general purpose	7	7930	9856911
00367	Povidone-iodine cleansing solution	7	6505	9947224
00368	Dichlorodifluoromethane, technical	5	6830	2904377

SPIN	NAME	GROUP #	FSC	NIIN
00368	Dichlorodifluoromethane, technical	5	6830	2904376
00374	Dishwashing compound, machine	7	7930	9856906
00393	Dry chemical, fire extinguisher	3	4210	7529343
00401	Enamel	12		
00408	Extinguisher, fire	5	4210	2030217
00444	Foam liquid, fire extinguishing	3	4210	2239877
00493	Gasket shellac compound	2	8040	13780235
00506	Battery, nonrechargeable	21	6135	12108715
00516	Glass cleaner	15		
00516	Glass cleaner	15	7930	1849423
00516	Glass cleaner	15	7930	6646910
00538	Graphite, colloidal	11	9150	10206710
00539	Graphite, dry	11	9620	2336712
00540	Grease	8	9150	3921670
00542	Grease, aircraft	8		
00542	Grease, aircraft	8	9150	1817724
00542	Grease, aircraft	8	9150	1450268
00542	Grease, aircraft	8	9150	9355851
00542	Grease, aircraft	8	9150	12623358
00542	Grease, arresting gear	8	9150	12377468
00546	Grease, aircraft	8	9150	2698255
00548	Sealing compound	2	8030	11329623
00549	Grease, aircraft and instrument	8		
00549	Grease, aircraft and instrument	8	9150	9857245
00549	Grease, aircraft and instrument	8	9150	9857246
00549	Grease, aircraft and instrument	8	9150	9857247
00549	Grease, aircraft and instrument	8	9150	9354017
00549	Grease, aircraft and instrument	8	9150	9857244
00549	Grease, aircraft and instrument	8	9150	9857248
00550	Grease, aircraft and instrument	8	9150	1450161
00553	Grease, aircraft ordnance	8	9150	5593071
00555	Grease, automotive and artillery	8		
00555	Grease, automotive and artillery	8	9150	11977692
00555	Grease, automotive and artillery	8	9150	11977691
00555	Grease, automotive and artillery	8	9150	11977689
00556	Grease, ball and roller bearing	8		
00556	Grease, ball and roller bearing	8	9150	1416770
00556	Grease, ball and roller bearing	8	9150	8238048
00558	Grease, ball and roller bearing	8		
00561	Grease, general purpose	8		
00563	Grease, general purpose	8		
00563	Grease, general purpose	8	9150	1806381
00563	Grease, general purpose	8	9150	1806383
00563	Grease, general purpose	8	9150	1806382
00564	Grease, general purpose	8		

SPIN	NAME	GROUP #	FSC	NIIN
00565	Grease, general purpose	8		
00565	Grease, general purpose	8	9150	2355555
00565	Grease, general purpose	8	9150	8238047
00565	Grease, general purpose	8	9150	9857316
00567	Grease, general purpose	8	9150	9452249
00568	Grease, graphite	8		
00575	Grease, molybdenum disulfide	8		
00575	Grease, molybdenum disulfide	8	9150	2234004
00575	Grease, molybdenum disulfide	8	9150	9652003
00575	Grease, molybdenum disulfide	8	9150	7542595
00575	Grease, molybdenum disulfide	8	9150	9354018
00576	Grease, molybdenum disulfide	8	9150	9436880
00578	Grease, molybdenum disulfide	8	9150	9857317
00579	Grease, plug valve	8	9150	2618287
00580	Grease, plug valve	8		
00582	Grease, plug valve	8	9150	2575360
00584	Grease, silicone insulated electric	8	9150	10809652
00585	Grease, wire rope-exposed gear	8	9150	5306814
00605	Polyurethane coating	12	8010	4825651
00620	Lubricating oil, steam turbine	11		
00620	Lubricating oil, steam turbine	11	9150	12637241
00620	Lubricating oil, steam turbine	11	9150	12637240
00620	Lubricating oil, steam turbine	11	9150	12637239
00620	Lubricating oil, steam turbine	11	9150	12637242
00627	Hydraulic fluid, fire resistant	9		
00627	Hydraulic fluid, fire resistant	9	9150	12566433
00627	Hydraulic fluid, fire resistant	9	9150	12642639
00627	Hydraulic fluid, fire resistant	9	9150	12637244
00630	Desiccant, activated	17	6850	10369625
00639	Helium, technical	5	6830	1690789
00643	Sodium carbonate, anhydrous, technical	17	6810	2331715
00646	Citric acid, monohydrate	1	6810	5976098
00661	Hydraulic fluid, petroleum base	9		
00661	Hydraulic fluid, petroleum base	9	9150	2234134
00661	Hydraulic fluid, petroleum base	9	9150	827524
00661	Hydraulic fluid, petroleum base	9	9150	2659408
00661	Hydraulic fluid, petroleum base	9	9150	2526383
00664	Hydraulic fluid, automatic transmission	9	9150	6982382
00665	Hydraulic fluid, fire resistant	9		
00665	Hydraulic fluid, fire resistant	9	9150	11132046
00665	Hydraulic fluid, fire resistant	9	9150	11132047
00665	Hydraulic fluid, fire resistant	9	9150	11132045
00666	Hydraulic fluid, noncombustible	9		
00670	Hydraulic fluid, petroleum base	9		
00670	Hydraulic fluid, petroleum base	9	9150	2904091

SPIN	NAME	GROUP #	FSC	NIIN
00670	Hydraulic fluid, petroleum base	9	9150	2618318
00670	Hydraulic fluid, petroleum base	9	9150	2618317
00683	Inhibitor, corrosion, liquid cooling	6	6850	1395319
00691	Insulating oil, electrical	11	9160	6850913
00697	Cleaning compound, solvent	15	6850	12770595
00698	Isopropyl alcohol, usp	15		
00698	Isopropyl alcohol, usp	15	6505	2998095
00698	Isopropyl alcohol, usp	15	6505	2617256
00699	Isopropyl alcohol, acs	15	6810	2270410
00700	Isopropyl alcohol, technical	15		
00700	Isopropyl alcohol, technical	15	6810	8556160
00700	Isopropyl alcohol, technical	15	6810	11902538
00701	Isopropyl alcohol, technical	15		
00701	Isopropyl alcohol, technical	15	6810	9838551
00701	Isopropyl alcohol, technical	15	6810	2865435
00701	Isopropyl alcohol, technical	15	6810	7534993
00709	Battery, storage	21	6140	11494810
00711	Sulfamic acid, technical	1	6810	12369402
00716	Grease	8		
00742	Lapping and grinding compound	14	5350	1937227
00744	Lapping and grinding compound	14	5350	1931341
00745	Lapping and grinding compound	14	5350	5761687
00746	Lapping and grinding compound	14	5350	1931348
00748	Lapping and grinding compound	14	5350	1931356
00749	Layout dye	10	6850	6649067
00754	Leak test compound	7	6850	6211820
00755	Sealing compound	2	8030	9996313
00760	Detergent, general purpose	7	7930	5152477
00761	Silicone compound	11	6850	2940860
00766	Linseed oil, raw	14	5350	2210611
00772	Lubricating oil, aircraft piston	11		
00772	Lubricating oil, aircraft piston	11	9150	9652303
00772	Lubricating oil, aircraft piston engine	11	9150	195701
00777	Lubricant, solid film	11	9150	12602534
00777	Lubricant, solid film	11	9150	9547422
00778	Lubricating oil, exposed gear	11	9150	2345199
00779	Hydraulic fluid, petroleum base	9		
00779	Hydraulic fluid, petroleum base	9	9150	9857234
00779	Hydraulic fluid, petroleum base	9	9150	5825480
00779	Hydraulic fluid, petroleum base	9	9150	7534799
00781	Lubricating oil, aircraft turboshaft	11	9150	9857099
00781	Lubricating oil, aircraft turboshaft	11	9150	6815999
00781	Lubricating oil, aircraft turboshaft	11	9150	1806266
00782	Lubricating oil, aircraft turbine	11	9150	2738807
00783	Lubricating oil, aircraft piston	11	9150	7535060

SPIN	NAME	GROUP #	FSC	NIIN
00785	Lubricating oil, colloidal graphite	11	9150	2355581
00786	Lubricating oil, compounded	11	9150	2316646
00787	Lubricating oil, compounded	11	9150	115892
00788	Lubricating oil, compounded	11	9150	2316662
00789	Lubricating oil, compounded	11	9150	2316661
00791	Lubricating oil, engine	11	9150	1866681
00793	Lubricating oil, engine	11	9150	1113199
00794	Lubricating oil, engine	11	9150	1110209
00795	Lubricating oil, engine	11		
00795	Lubricating oil, engine	11	9150	1818229
00795	Lubricating oil, engine	11	9150	1818097
00801	Lubricating oil, gear	11		
00801	Lubricating oil, gear	11	9150	2234130
00801	Lubricating oil, gear	11	9150	2234116
00802	Lubricating oil, gear	11		
00802	Lubricating oil, gear	11	9150	10355395
00802	Lubricating oil, gear	11	9150	10484591
00803	Lubricating oil, gear	11		
00805	Lubricating oil, mineral	11		
00808	Lubricating oil, gear	11	9150	2402235
00811	Lubricating oil, general purpose	11		
00812	Lubricating oil, general purpose	11		
00814	Lubricating oil, general purpose	11		
00816	Hydraulic fluid, petroleum base	9		
00816	Hydraulic fluid, petroleum base	9	9150	12637243
00816	Hydraulic fluid, petroleum base	9	9150	12638427
00817	Lubricating oil, general purpose	11		
00817	Lubricating oil, general purpose	11	9150	2618146
00817	Lubricating oil, general purpose	11	9150	8368641
00817	Lubricating oil, general purpose	11	9150	2319045
00819	Lubricating oil, general purpose	11		
00819	Lubricating oil, general purpose	11	9150	5421430
00819	Lubricating oil, general purpose	11	9150	2633490
00821	Lubricating oil, air compressor	11	9150	9652399
00823	Lubricating oil, general purpose	11		
00823	Lubricating oil, general purpose	11	9150	2312361
00823	Lubricating oil, general purpose	11	9150	2718427
00823	Lubricating oil, general purpose	11	9150	2312356
00824	Hydraulic fluid, petroleum base	9		
00824	Hydraulic fluid, petroleum base	9	9150	9857232
00824	Hydraulic fluid, petroleum base	9	9150	9857233
00824	Hydraulic fluid, petroleum base	9	9150	9857231
00828	Hydraulic fluid, petroleum base	9		
00828	Hydraulic fluid, petroleum base	9	9150	9857237
00828	Hydraulic fluid, petroleum base	9	9150	5842560

SPIN	NAME	GROUP #	FSC	NIIN
00828	Hydraulic fluid, petroleum base	9	9150	9857236
00830	Primer, sealing compound	2	8030	9002373
00831	Lubricating oil, general purpose	11		
00831	Lubricating oil, general purpose	11	9150	4580075
00831	Lubricating oil, general purpose	11	9150	2732389
00831	Lubricating oil, general purpose	11	9150	2812060
00831	Lubricating oil, general purpose	11	9150	2319062
00831	Lubricating oil, general purpose	11	9150	2316689
00834	Lubricant, solid film	11	9150	12326884
00835	Epoxy primer coating kit	12	8010	12366971
00836	Lubricating oil, instrument	11	9150	2355590
00837	Primer coating	12	8010	5152208
00839	Lubricating oil, instrument	11		
00839	Lubricating oil, instrument	11	9150	6646518
00839	Lubricating oil, instrument	11	9150	2575449
00839	Lubricating oil, instrument	11	9150	2234129
00840	Lubricating oil, mineral, steam cylinder	11	9150	2402260
00841	Lubricating oil, molybdenum disulfide	11	9150	5437220
00843	Lubricating oil, refrigerant compressor	11		
00844	Lubricating oil, refrigerant compressor	11		
00844	Lubricating oil, refrigerant compressor	11	9150	6644447
00844	Lubricating oil, refrigerant compressor	11	9150	8237905
00846	Lubricating oil, semifluid	11	9150	6874241
00846	Lubricating oil, semifluid	11	9150	8893522
00848	Lubricating oil, steam turbine	11		
00848	Lubricating oil, steam turbine	11	9150	13687075
00848	Lubricating oil, steam turbine	11	9150	13687076
00848	Lubricating oil, steam turbine	11	9150	2359064
00848	Lubricating oil, steam turbine	11	9150	13702583
00849	Lubricating oil, engine	11	9150	1178791
00850	Lubricating oil, watch	11	9150	2526382
00887	Methanol, technical	15	6810	5973608
00894	Molybdenum disulfide, technical	8	6810	8161025
00905	Naphtha, aromatic	15	6810	2011316
00906	Neat's-foot oil	11	8030	2441031
00915	Nitrogen, technical	5	6830	2442741
00936	Orthophosphoric acid, technical	1	6810	2646722
00940	Lubricant, solid film	11	9150	12602534
00957	Paint, general purpose	12		
00958	Paint, heat resisting	12	8010	8152692
00975	Lubricating oil, semifluid	11	9150	9490323
00979	Penetrating fluid	11	6850	9739091
00980	Penetrating oil	11	9150	2617899
00982	Petrolatum, technical	11		
00982	Petrolatum, technical	11	9150	2500933

SPIN	NAME	GROUP #	FSC	NIIN
00982	Petrolatum, technical	11	9150	2500926
00986	Phenolphthalein, acs	17	6810	2237612
00998	Sealing compound	2	8030	10693046
00998	Sealing compound	2	8030	10556126
00998	Sealing compound	2	8030	10543968
00999	Insulating compound, electrical	12	5970	2415406
01017	Lubrication kit, steering cable	11	5180	13176092
01019	Glass cleaner	7	7930	9012088
01045	Polish, metal	14		
01046	Polish, metal	14		
01046	Polish, metal	14	7930	2667137
01046	Polish, metal	14	7930	2667136
01047	Polish, metal	14		
01048	Polish, metal	14	7930	2667135
01049	Polish, plastic	14	7930	9353794
01051	Potassium hydroxide solution	3	6810	2812029
01062	Primer, coating	12		
01078	Calibration fluid	11	6850	11434525
01111	Grease, plug valve	8	9150	7812327
01113	Remover, paint	15		
01118	Primer coating	12	8010	12851329
01122	Cleaning compound, solvent-detergent	4	7930	13068369
01132	Polyurethane coating	12	8010	10683115
01133	Epoxy primer coating kit	12	8010	1429279
01148	Scale removing compound	1	6850	6376142
01154	Scouring powder	4	7930	12941116
01219	Sealing compound	2	8030	812331
01219	Sealing compound	2	8030	9004412
01219	Sealing compound	2	8030	812330
01221	Sealing compound	2	8030	5844399
01223	Sealing compound	2	8030	812341
01223	Sealing compound	2	8030	10139503
01223	Sealing compound	2	8030	812340
01227	Sealing compound	2	8030	5152251
01228	Sealing compound	2	8030	2460931
01229	Sealing compound	2	8030	2643888
01230	Sealing compound	2	8030	2460933
01232	Sealing compound	2		
01232	Sealing compound	2	8030	8490071
01232	Sealing compound	2	8030	2523391
01233	Sealing compound	2	8030	812328
01233	Sealing compound	2	8030	812329
01234	Sealing compound	2		
01234	Sealing compound	2	8030	2206973
01234	Sealing compound	2	8030	6561426

SPIN	NAME	GROUP #	FSC	NIIN
01247	Shellac, cut	15	8010	1654761
01254	Silicone compound	11	6850	9635402
01255	Silicone compound	11	6850	6644959
01257	Silicone compound	11	6850	9750712
01258	Silicone compound	11	6850	7024297
01259	Silicone compound	11		
01259	Silicone compound	11	6850	1775094
01259	Silicone compound	11	6850	8807616
01259	Silicone compound	11	6850	2957685
01267	Soap, laundry	7	7930	9654868
01280	Lubricating oil, weapons	11	9150	2929689
01286	Cleaning compound, optical lens	4	6850	5923283
01290	Cleaning compound, solvent	15	6850	1826467
01291	Epoxy coating kit	12	8010	13504744
01293	Epoxy coating kit	12		
01293	Epoxy coating kit	12	8010	9486733
01293	Epoxy coating kit	12	8010	10532652
01294	Epoxy coating kit	12		
01294	Epoxy coating kit	12	8010	10197947
01297	Sodium bicarbonate, technical	3	6810	2646618
01299	Sodium chromate, anhydrous, technical	17	6810	2402119
01300	Adhesive	2	8040	8779872
01302	Sodium phosphate, tribasic, anhydrous	3	6810	1416080
01304	Sodium phosphate, dibasic, anhydrous	3	6810	2646630
01305	Solder, lead alloy	20	3439	10749983
01307	Solder, tin alloy	20	3439	2699610
01320	Standard conductivity	17	6810	9457682
01381	Battery, nonrechargeable	21	6135	13056958
01385	Thermometer, self-indicating, liquid	20	6685	2439964
01386	Thermometer, indicating, capillary	20	6685	3377180
01389	Thinner, paint products	15	8010	2422089
01391	Toluene, technical	15		
01391	Toluene, technical	15	6810	2900046
01391	Toluene, technical	15	6810	2900048
01418	Varnish, oil	12	8010	1806343
01428	Wax, general purpose, solvent type	14	7930	5308374
01431	Pigment, paint products	11	8010	2395736
01470	Sealing compound	2	8030	3126128
01548	Disinfectant-detergent, general	7	6840	5261129
01550	Grease, aircraft and instrument	8	9150	9618995
01550	Grease, aircraft and instrument	8	9150	9618995
01551	Iodophor/disinfectant	7		
01552	Lubricant, solid film	11	9150	9487025
01553	Lubricant	11	9150	9357127
01558	Battery, nonrechargeable	21	6135	9477091

SPIN	NAME	GROUP #	FSC	NIIN
01563	Lubricating oil, colloidal graphite	11	9150	2355584
01565	Lubricating oil, compounded	11		
01570	Insulating compound, electrical	12	5970	2959298
01572	Lubricating oil, engine	11	9150	1896727
01572	Lubricating oil, engine	11	9150	1866668
01573	Lubricating oil, instrument	11	9150	1817314
01579	Sealing compound	2	8030	87207
01580	Cleaning compound, aircraft surface	4	6850	55305
01580	Cleaning compound, aircraft surface	4	6850	10457929
01580	Cleaning compound, aircraft surface	4	6850	10457930
01580	Cleaning compound, aircraft surface	4	6850	10457931
01580	Cleaning compound, aircraft surface	4	6850	12240098
01581	Grease, aircraft	8	9150	1199291
01584	Silicone compound	11		
01589	Corrosion preventive compound	6	8030	13470983
01589	Corrosion preventive compound	6	8030	13470979
01590	Sealing compound	2	8030	812339
01590	Sealing compound	2	8030	812338
01590	Sealing compound	2	8030	676744
01591	Sealing compound	2	8030	819022
01591	Sealing compound	2	8030	4561038
01591	Sealing compound	2	8030	812335
01592	Lub oil, shpbd rcpig air compressor	11		
01596	Grease, aircraft	8	9150	9355851
01596	Grease, aircraft	8	9150	9448953
01596	Grease, ball and roller bearing	8		
01596	Grease, ball and roller bearing	8	9150	1491593
01596	Grease, ball and roller bearing	8	9150	11172928
01596	Grease, ball and roller bearing	8	9150	1491592
01596	Grease, ball and roller bearing	8	9150	13046603
01596	Grease, ball and roller bearing	8	9150	1491593
01596	Grease, ball and roller bearing	8	9150	11172928
01598	Lubricating oil, gear	11		
01598	Lubricating oil, gear	11	9150	10355393
01598	Lubricating oil, gear	11	9150	10355392
01598	Lubricating oil, gear	11	9150	13132191
01600	Glycerin-water mixture	11	6810	1729098
01603	Battery, nonrechargeable	21	6135	9002139
01612	Enamel	12	8010	5272053
01612	Enamel	12	8010	5272050
01612	Enamel	12	8010	2867725
01613	Enamel	12	8010	8529033
01613	Enamel	12	8010	2867758
01613	Enamel	12	8010	5272045
01613	Enamel	12	8010	6167488

SPIN	NAME	GROUP #	FSC	NIIN
01615	Grease, general purpose	8		
01620	Insulating varnish, electrical	12	5970	9623335
01625	Corrosion resistant coating, chemical	6	8030	1429272
01625	Corrosion resistant coating, chemical	6	8030	650957
01646	Diesel fuel, marine	19		
01647	JP-5 Fuel (Aviation)	19		
01648	Gasoline fuel	19		
01651	Lubricating compound	11		
01655	Pretreatment coating	1		
01656	Adhesive	2	8040	618303
01661	Grease, aircraft and instrument	8	9150	10880498
01662	Grease, aircraft and instrument	8	9150	10074384
01674	Thinner, paint products	15	8010	1605788
01678	Leak detector, refrigerant gas	7	4940	8250198
01679	Battery, nonrechargeable	21	6135	8357210
01685	Petrolatum, liquid, technical	11		
01690	Sealing compound	2	8030	6827450
01693	Lubricating oil, steam turbine	11	9150	2359062
01694	Silicone compound	11	6850	9279461
01704	Cartridge, carbon dioxide	5	4220	8058383
01714	Cylinder, compressed gas, dichloro	5	8120	13554017
01720	Chloride titrator	17	6850	1806165
01728	Cylinder, compressed gas	5	8120	13561245
01731	Cylinder, compressed gas	5	8120	13561246
01733	Lubricating oil	11	9150	5297222
01749	Lubricating compound, dimethylsil	11	9150	8237860
01750	Grease	8	9150	10410092
01751	Emulsified oil, dust	11		
01761	Freezing compound	4		
01762	Lubricating oil, hydraulic	11	9150	825636
01774	Enamel	12	8010	13445108
01788	Antiseize compound	8	8030	1490335
01815	Hand cleaner	7	8520	2258563
01816	Inhibitor, corrosion, vapor barrier	6	6850	3685233
01831	Desiccant, activated	17	6850	9355810
01859	Enamel	12	8010	9108154
01860	Sealing compound	2	8030	11549255
01861	Desiccant, activated	17	6850	2606299
01873	Desiccant, activated	17	6850	8567955
01876	Desiccant, activated	17	6850	10548897
01877	Graphite, colloidal	11	9150	9268963
01879	Desiccant, activated	17	6850	10548898
01880	Desiccant, activated	17	6850	11434911
01882	Corrosion preventive, aircraft engine	6	6850	1429582
01895	Vinegar	1	8950	10793978

SPIN	NAME	GROUP #	FSC	NIIN
01897	D-A power fluid	11		
01898	Battery, nonrechargeable	21	6135	12686726
01901	Enamel	12		
01901	Enamel	12	8010	14416147
01901	Enamel	12	8010	14416146
01904	Cleaning compound, solvent-detergent	4	7930	13425315
01911	Varnish, asphalt	12	8010	2990214
01933	Battery, storage	21	6140	10415021
01940	Battery assembly	21	6140	12976202
01958	Grease, lubricating	8		
01976	Epoxy coating kit	12		
01976	Epoxy coating kit	12	8010	13023607
01976	Epoxy coating kit	12	8010	13504745
01977	Oil	11		
01978	Barometer, aneroid	20	6685	2904034
01980	Kit-penetrant inspection	10		
01996	Repair kit, diving equipment	2	4220	6941410
01999	Cleaning compound	4		
01999	Cleaning compound	4	6850	1817597
01999	Cleaning compound	4	6850	1817594
02004	Grease, aircraft	8	9150	4190628
02027	Cleaning compound, solvent	15		
02027	Cleaning compound, solvent	15	6850	13718049
02027	Cleaning compound, solvent	15	6850	13718048
02029	Plating solution additive, silver	3	6850	5610349
02034	Polish, automobile	14	7930	7218873
02050	Enamel	12	8010	2854858
02050	Enamel	12	8010	14415909
02050	Enamel	12	8010	2854869
02051	Primer, coating	12		
02054	Water indicating paste	10	6850	14194
02055	Rinse additive, dishwashing	7	7930	10460163
02057	Cleaner, lubricant and preservative	11		
02057	Cleaner, lubricant and preservative	11	9150	10536688
02057	Cleaner, lubricant and preservative	11	9150	11021473
02057	Cleaner, lubricant and preservative	11	9150	10796124
02057	Cleaner, lubricant and preservative	11	9150	10546453
02057	Cleaner, lubricant and preservative	11	9150	13279631
02060	Standard chloride solution	17	6810	11293762
02061	Standard hardness solution	17	6810	11255234
02067	Coating kit, abrasion	12	8030	979088
02071	Epoxy coating kit	12		
02071	Epoxy coating kit	12	8010	13802389
02071	Epoxy coating kit	12	8010	13802362
02103	Alcohol, dehydrated	15	6505	1050000

SPIN	NAME	GROUP #	FSC	NIIN
02115	Grease, general purpose	8	9150	1414481
02122	Primer coating	12	8010	13682633
02123	Primer coating	12	8010	12851328
02125	Primer coating	12	8010	13871069
02128	Disk cleaning kit	15	7045	13093489
02131	Enamel	12	8010	13445317
02133	Calibrating gas mixture	5	6830	2031492
02142	Calibrating gas mixture	5	6830	4064766
02144	Sealing compound	2	8030	1806222
02145	Antifreeze	15	6850	6641409
02147	Sealing compound	2	8030	11660675
02150	Alcohol, medicinal	15		
02185	Descaler, biodegrade	1	6850	1487667
02204	Cleaning solution	4		
02206	Coating, ablative	12	8030	1644389
02217	Corrosion preventive compound	6	8030	9649169
02240	Potassium carbonate	3	6810	4995825
02252	Ph indicator solution	17	6810	6641622
02265	Cleaning compound, high pressure	3		
02265	Cleaning compound, high pressure	3	6850	9652329
02265	Cleaning compound, high pressure	3	6850	2560157
02266	Grease, general purpose	8	9150	6631770
02268	Boiler compound	17	6850	2550429
02283	Dry cleaning solvent, PD-680 type III	15		
02283	Dry cleaning solvent, PD-680 type III	15	6850	13313350
02283	Dry cleaning solvent, PD-680 type III	15	6850	13771808
02283	Dry cleaning solvent, PD-680 type III	15	6850	13771809
02283	Dry cleaning solvent, PD-680 type III	15	6850	13771811
02283	Dry cleaning solvent, PD-680 type III	15	6850	13313349
02287	Adhesive	2		
02287	Adhesive	2	8040	1658614
02287	Adhesive	2	8040	8433461
02287	Adhesive	2	8040	7148223
02287	Adhesive	2	8040	8098252
02287	Adhesive	2	8040	2738716
02287	Adhesive	2	8040	2738717
02294	Adhesive	2		
02294	Adhesive	2	8040	6644318
02294	Adhesive	2	8040	2213811
02294	Adhesive	2	8040	2629005
02294	Adhesive	2	8040	2904301
02295	Soap, toilet	7	8520	5316484
02298	Adhesive	2		
02298	Adhesive	2	8040	10250237
02298	Adhesive	2	8040	8263535

SPIN	NAME	GROUP #	FSC	NIIN
02298	Adhesive	2	8040	10246988
02298	Adhesive	2	8040	1429193
02300	Primer coating	12	8010	1697082
02304	Sodium metasilicate, anhydrous, technical	3	6810	6647062
02308	Lubricant, solid	11	9150	9681444
02314	Desiccant, activated	17	6850	8652418
02323	Lubricant, solid film	11	9150	13601907
02324	Antistatic and cleaner compound	4	6850	12839966
02327	Insulating compound, electrical	12	5970	2336239
02341	Lubricating compound	11	9150	10489394
02344	Glycerol, technical	11	6810	2646548
02346	Primer, coating compound	12	8030	1376129
02347	Wax, gasket sealing	14	9160	5264159
02350	Monoethanolamine-chelating	3	6810	9589970
02355	Disinfectant-detergent, general purpose	7	6840	9261686
02356	Grease, general purpose	8		
02360	Cleaner, magnetic tape head	15		
02361	2-ethylhexanol, technical	15	6810	7978621
02362	Cylinder, compressed gas	5	8120	1781598
02364	Lubricant, stick form	11	9150	687862
02367	Hydraulic fluid, catapult	9		
02367	Hydraulic fluid, catapult	9	9150	10805962
02367	Hydraulic fluid, catapult	9	9150	10805961
02370	Grease, plug valve	8	9150	2618289
02370	Grease, plug valve	8	9150	2618291
02370	Grease, plug valve	8	9150	2618292
02379	Bleach, laundry, organic chlorine	18	6850	632842
02386	Thermometer, self-indicating, liquid	20	6685	8944516
02387	Thermometer, self-indicating, liquid	20	6685	8944515
02388	Pigment, paint products	12	8010	6641414
02393	Antiseize compound	11	8030	6646146
02394	Heat transfer fluid	11	6850	9059098
02395	Lubricating oil, vacuum pump	11	9150	2738663
02396	Carbon dioxide, technical	5	6830	1428841
02401	Ethylene glycol monoethyl ether,	15	6810	2854309
02402	Ethylene glycol, technical	15	6810	64205
02405	Leak test compound	7	6850	6211819
02407	Cleaning solvent, approved safety	15		
02416	Mineral oil, usp	11	6505	1336000
02420	Primer, sealing compound	2	8030	1818372
02421	Sealing compound	2	8030	812327
02422	Cleaning and lubricating compound	4	6850	8807007
02429	Sealing compound	2	8030	13846607
02436	Cleaning compound, solvent	15	6850	2246665
02442	Sodium hydroxide, technical	3	6810	2708177

SPIN	NAME	GROUP #	FSC	NIIN
02445	Buffing compound	14	5350	1937225
02445	Buffing compound	14	5350	1845826
02445	Buffing compound	14	5350	1919774
02446	Cutting fluid	11	9150	2526371
02446	Cutting fluid	11	9150	2526373
02449	Insulating compound, electrical	12	5970	10138611
02452	Ion exchange compound	17	6810	5593267
02454	Nitric acid, technical	1	6810	2229655
02461	Trichlorotrifluoroethane, technical	15	6830	5842957
02464	Lubricant, solid film	11	9150	9857255
02466	Cleaning compound, solvent	15	6850	1053084
02469	Primer, electric and percussion	12	1390	7267457
02489	Cleaner, slidewire	4	4931	4061511
02521	Lubricating compound	11	9150	4826884
02565	Cleaning compound	4		
02569	Lithium bromide charge	18	6810	7978619
02575	Calibrating gas mixture	5	6830	4984241
02576	Lithium hydroxide, technical	3	6810	5593261
02581	Foam liquid, fire extinguishing	3	4210	10568343
02586	Penetrating fluid	11	6850	10438511
02593	Coating compound, nonslip	12	8010	8572450
02598	Corrosion preventive compound	6	8030	1450111
02598	Corrosion preventive compound	6	8030	5152488
02615	Phosphoric acid, acs	1	6810	7534777
02616	Adhesive	2	8040	7534800
02617	Lubricating fluid, oxidizing gas	11	9150	11018836
02618	Lubricating oil, molybdenum disul	11	9150	4243224
02620	Lubricating oil, general purpose	11	9150	12063626
02621	Lubricating oil, two-cycle engine	11		
02623	Lubricating fluid, oxidizing gas	11	9150	11018836
02623	Lubricating fluid, oxidizing gas	11	9150	11018835
02623	Lubricating fluid, oxidizing gas	11	9150	11018834
02635	Xylene, technical	15	6810	5986600
02637	Insulating varnish, electrical	12	5970	5830401
02637	Insulating varnish, electrical	12	5970	1617422
02640	Lubricant	11	1040	896295
02641	Bromophenol blue solution	17	6810	2817456
02652	Lubricating oil, gear	11	9150	10355390
02662	Hydrochloric acid, technical	1	6810	2229641
02666	Lubricating oil, engine	11	9150	12781357
02672	Lubricant, fluorocarbon	11	9150	14439003
02688	Lubricating oil, preservative	11	9150	8893523
02689	Beeswax, technical	14	9160	2531171
02697	Fluid, recoil	11	1020	4918679
02698	Kerosene	19	9140	2426748

SPIN	NAME	GROUP #	FSC	NIIN
02724	Lubricating oil, engine	11	9150	11524117
02725	Gasket	16	5330	13922760
02729	Packing material	16	5330	6183222
02731	Packing	16		
02732	Gasket	16	5330	13838032
02736	Packing material	16	5330	1861743
02737	Packing material	16	5330	6183221
02739	Packing material	16	5330	14676105
02740	Packing material	16	5330	6183226
02741	Packing material	16	5330	1979654
02742	Packing material	16	5330	1861747
02743	Packing material	16	5330	6183223
02744	Packing material	16	5330	14182865
02745	Packing	16		
02746	Packing material	16	5330	6183225
02747	Packing material	16	5330	12333043
02748	Packing material	16	5330	14157775
02753	Grease, graphite	8		
02785	Detergent, general purpose	7	7930	5581111
02788	Soap, laundry	7	7930	6343935
02788	Soap, laundry	7	7930	9265262
02793	Battery, nonrechargeable	21		
02795	Battery, nonrechargeable	21	6135	10283095
02821	Lubricating oil, aircraft turbine	11	9150	1085359
02823	Adhesive	2	8040	9321945
02827	Cleaning compound, general purpose	4	6850	11085798
02834	Nitrogen, technical	5	6830	10403847
02835	Inhibitor, corrosion, liquid cooling	6		
02835	Inhibitor, corrosion, liquid cooling	6	6850	10863438
02835	Inhibitor, corrosion, liquid cooling	6	6850	10854717
02835	Inhibitor, corrosion, liquid cooling	6	6850	10854718
02836	Compound, molding	2		
02836	Compound, molding	2	8030	2298736
02836	Compound, molding	2	8030	2298735
02846	Lubricating oil, exposed gear	11	9150	9354127
02847	Hydraulic fluid, fire resistant	9	9150	1497432
02847	Hydraulic fluid, fire resistant	9	9150	1497431
02854	Hydraulic fluid, petroleum base	9	9150	9359809
02856	Detergent, general purpose	7	7930	5308067
02863	Adhesive	2	8040	8430802
02879	Chloride test table	17	6850	2011257
02881	Corrosion preventive compound	6	8030	9620685
02958	Coater, filter, air conditioner	12	4130	8600042
02959	Adhesive	2	8040	4448752
02998	Packing material	16	5330	13888456

SPIN	NAME	GROUP #	FSC	NIIN
03019	Lubricating oil, refrigerant compressor	11	9150	5982911
03019	Lubricating oil, refrigerant compressor	11	9150	2929657
03035	Corrosion preventive compound	6	8030	5468637
03041	Cartridge, water demineralizer, ion exchange	17	4610	3635770
03056	Sodium phosphate, tribasic, anhydrous	3	6810	1416078
03060	Grease, moly-koat g	8		
03068	Adhesive	2		
03068	Adhesive	2	8040	1429823
03068	Adhesive	2	8040	7283088
03068	Adhesive	2	8040	2254548
03069	Paint, conductive, copper	12	8010	12898318
03083	Thermometer, self-indicating	20	6685	519480
03089	Coating compound, metal pretreatment	1	8030	8507076
03122	Epoxy coating kit	12	8010	13023606
03123	Epoxy coating kit	12	8010	13023608
03124	Epoxy coating kit	12	8010	13026838
03132	CO2 bottle	5		
03141	Cleaning compound, solvent-detergent	4	7930	13464289
03157	Desiccant, activated	17	6850	12131235
03177	Ethyl alcohol, technical	15	6810	8238003
03178	Cleaning and lubricating compound	15	6850	5709360
03178	Cleaning compound, solvent	15		
03178	Cleaning compound, solvent	15	6850	13949514
03182	Desiccant, activated	17	6850	6802233
03188	Primer, adhesive	2	8040	838403
03191	Damping fluid	11	9150	249624
03196	Packing material	16	5330	2689879
03197	Packing material	16	5330	2689880
03207	Comparator, color	17	6630	10673827
03213	Decontaminating agent	7	6850	12308556
03223	Battery, storage	21	6140	10269949
03225	Adhesive	2	8040	13896930
03228	Grease, ordnance, extreme pressure	8	9150	14680088
03230	Hydraulic fluid, automatic transmission	9	9150	6574959
03231	Lubricating oil, air compressor	11	9150	11025020
03233	Battery, nonrechargeable	21	6135	2744035
03235	Battery, nonrechargeable	21	6135	2695843
03237	Lubricating kit	11	9150	10416648
03238	Grease, ordnance, extreme pressure	8	9150	6640050
03239	Lubricant	11	9150	9944539
03240	Cutting fluid	11	9150	2316699
03240	Cutting fluid	11	9150	2659406
03240	Cutting fluid	11	9150	2319054
03244	Lubricating oil, pump	11	9150	10174704
03246	Lubricant, aluminum	11	9150	10127533

SPIN	NAME	GROUP #	FSC	NIIN
03247	Cutting fluid	11	9150	10135281
03248	Grease, ground glass joint	8	9150	9652408
03249	Lubricating oil, engine	11	9150	11784726
03253	Petroleum oil, white	11	9150	1376344
03254	Silicone compound	11		
03262	Packing material	16	5330	1861749
03267	Packing material	16	5330	1978524
03268	Packing material	16	5330	1978529
03270	Packing material	16	5330	1978535
03271	Packing material	16	5330	1979647
03272	Packing material	16	5330	1979655
03273	Packing material	16	5330	1979673
03274	Asbestos sheet, compressed	16	5330	2222563
03275	Asbestos sheet, compressed	16	5330	2222564
03290	Gasket	16	5330	2462954
03303	Mercury, acs	20	6810	2817452
03304	Mercury, acs	20	6810	2817453
03305	Mercury, acs	20	6810	2817450
03312	Packing material	16	5330	12070619
03313	Packing assembly	16	5330	14577607
03318	Packing material	16	5330	5277493
03319	Packing material	16	5330	5277495
03320	Packing material	16	5330	5277503
03321	Asbestos sheet, compressed	16	5330	5279901
03328	Gasket	16	5330	11091371
03335	Asbestos sheet, compressed	16	5330	13961328
03337	Packing material	16	5330	50521
03338	Packing material	16	5330	62532
03340	Packing material	16	5330	1979641
03341	Packing material	16	5330	1979658
03343	Packing material	16	5330	14386757
03344	Packing material	16	5330	382922
03346	Packing material	16	5330	1978493
03348	Packing material	16	5330	1978528
03349	Packing material	16	5330	1978530
03350	Packing material	16	5330	1978536
03351	Packing material	16	5330	4503975
03353	Packing material	16	5330	1978542
03355	Packing material	16	5330	2629437
03357	Packing material	16	5330	4503894
03361	Packing material	16	5330	14710285
03365	Asbestos sheet, compressed	16	5330	2222562
03367	Asbestos sheet, compressed	16	5330	6411192
03369	Asbestos sheet, compressed	16	5330	10307428
03380	Packing material	16	5330	5596120

SPIN	NAME	GROUP #	FSC	NIIN
03381	Asbestos sheet, compressed	16	5330	5859496
03382	Gasket, spiral wound	16	5330	13795982
03384	Packing material	16	5330	14710288
03385	Asbestos sheet, compressed	16	5330	6411193
03389	Gasket, spiral wound	16	5330	1864099
03391	Gasket	16	5330	2126290
03395	Packing, preformed	16	5330	2494893
03396	Packing, preformed	16	5330	2510513
03410	Gasket set	16	5330	8165284
03436	Packing material	16	5330	2629439
03438	Putty	16	8030	1450300
03441	Desiccant, activated	17	6850	2929717
03442	Desiccant, activated	17	6850	9269156
03443	Desiccant, activated	17	6850	9269155
03444	Ion exchange compound	17	6810	8732554
03445	Cleaning and lubricating compound	4	6850	9733122
03446	Battery, nonrechargeable	21	6135	500915
03448	Preservative, compound	6	8030	11032868
03449	Armor all cleaner	4	7930	3577386
03453	Damping fluid	11	9150	8644973
03455	Desiccant, activated	17	6850	1671676
03456	Thinner, paint products	15	8010	1605787
03457	Corrosion preventive compound	6	8030	5973288
03464	Lubricating oil, instrument	11	9150	4555361
03465	Enamel	12		
03472	Wax, paraffin, technical	14	9160	2852048
03493	Remover, paint	15	8010	1817568
03497	Corrosion preventive compound	6	8030	2312353
03502	Desiccant, activated	17	6850	7381672
03512	Battery, storage	21	6140	7382550
03515	Primer coating	12		
03518	Reaction agent	17	6665	8780489
03530	Desiccant, activated	17	6850	9359878
03531	Cleaning compound, engine cooling	1	6850	5987328
03533	Methyl ethyl ketone, technical	15		
03533	Methyl ethyl ketone, technical	15	6810	6878429
03533	Methyl ethyl ketone, technical	15	6810	2812785
03533	Methyl ethyl ketone, technical	15	6810	2812762
03533	Methyl ethyl ketone, technical	15	6810	2648983
03542	Dichlorodifluoromethane, technical	5	6830	9022430
03550	Enamel	12		
03560	Cleaning compound, solvent	15	6850	13893880
03564	Cleaner, lubricant	11	9150	6264404
03567	Enamel	12	8010	1490261
03568	Lacquer	12	8010	6639434

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03570	Wax, aircraft	14	7930	13232005
03571	Corrosion preventive compound	6	8030	5985915
03580	Lubricating oil, food processing	11	9150	12377980
03581	Lubricating oil, food processing	11	9150	12377467
03582	Sealing compound	2	8030	7232746
03583	Gasket	16	5330	11606848
03583	Gasket	16	5330	11606849
03583	Gasket	16	5330	11606850
03590	Thermometer, self-indicating	20	6685	4444000
03597	Grease, food processing equipment	8	9150	12096868
03614	Sealing compound	2	8030	812333
03614	Sealing compound	2	8030	8237917
03614	Sealing compound	2	8030	9647537
03617	Cleaner, photographic	13	6750	6913822
03618	Sodium hypochlorite solution	13	6810	5987316
03623	Cleaning solution	4	7930	12139285
03631	Cleaning compound, solvent	15	6850	13893859
03635	Thermometer, self-indicating	20	6685	8411439
03638	Cleaning compound, optical lens	4	6850	1889875
03639	Corrosion preventive compound	6	8030	10595478
03646	Primer coating	12		
03655	Lubricant	11	9150	11592203
03658	Scale prevention compound	1	6850	11504921
03664	Corrosion removing compound	6	6850	1749672
03665	Sealing compound	2	8030	10251692
03693	Flux, soldering	6	3439	10699176
03706	Adhesive	2	8040	1818380
03708	Preservative coating, rubber	12	8030	12223252
03713	Lubricating oil, gear	11	9150	11499166
03716	Cleaner, kit, z100	4	7045	12302987
03731	Layout dye	10	6850	10139937
03736	Nitrogen, technical	5	6830	7586475
03737	Calibrating gas mixture	5	6830	11688488
03738	Calibrating gas mixture	5	6830	11086039
03741	Calibrating gas mixture	5	6830	2442285
03742	Sodium phosphate, dibasic	3	6810	5844298
03744	Cupric sulfate, acs	17	6810	2411203
03750	Calcium chloride, anhydrous, acs	17	6810	11262694
03751	Inhibitor, corrosion, liquid cooling	6		
03757	Nitric acid, reagent	1	6810	2709978
03759	Sealing compound	2	8030	7628807
03768	Adhesive	2	8040	9419984
03769	Battery assembly	21	6140	12274799
03770	Detector, leak	10	4940	10146037
03771	Kit, cleaning	4	6850	12019864

SPIN	NAME	GROUP #	FSC	NIIN
03772	Sealing compound	2	8030	2049149
03773	Cylinder, gas, nitrogen	5	8120	12817715
03774	Cylinder, gas, oxygen	5		
03780	Grease, high temperature	8	9150	11451259
03784	Methyl purple alkalinity indicator	17	6810	12598231
03791	Lacquer	12	8010	1711509
03793	Lacquer	12	8010	2482839
03795	Inspection penetrant developer, dry	10	6850	12410651
03799	Ammonia water	3		
03803	Battery, nonrechargeable	21		
03830	Epoxy coating kit	12	8010	13504741
03831	Epoxy coating kit	12		
03831	Epoxy coating kit	12	8010	13470916
03831	Epoxy coating kit	12	8010	13504742
03832	Epoxy coating kit	12	8010	4108461
03837	Primer, adhesive	2	8040	12500288
03841	Sealing compound	2	8030	95023
03842	Sealing compound	2	8030	1047747
03844	Silicone compound	11		
03844	Silicone compound	11	6850	4431183
03844	Silicone compound	11	6850	10463643
03863	Battery, nonrechargeable	21	6135	11864010
03867	Cleaning compound, avionic components	4	6850	1487161
03869	Polyurethane coating	12	8010	13226624
03916	Sealing compound	2	8030	87198
03933	Adhesive	2	8040	1178510
03946	Hand cleaner	7	8520	9652109
03948	Calibration gas	5	6830	13409650
03951	Adhesive	2	8040	12053995
03962	KCl solution	3		
03965	Lubricating oil, special	11	9150	10083336
03967	Sealing compound	2	8030	10482087
03969	Nitric acid, acs	1	6810	7534779
03971	Inhibitor, corrosion, liquid cooling	6	6850	11603868
03971	Inhibitor, corrosion, liquid cooling	6	6850	11603867
03973	Insulating compound, electrical	12	5970	11483397
03974	Water-displacing compound	4	6850	1429389
03976	Primer, sealing compound	2	8030	822508
03978	Battery, nonrechargeable	21	6135	9857845
03979	Lubricating oil, gear	11	9150	13306167
03980	Battery, nonrechargeable	21	6135	9260827
03985	Remover, paint	15	8010	1605799
03985	Remover, paint	15	8010	5978234
03988	Epoxy primer coating kit	12	8010	822450
03989	Polyurethane coating	12	8010	1818281

SPIN	NAME	GROUP #	FSC	NIIN
03990	Coating	12	4935	12532227
03991	Corrosion preventive compound	6	8030	10083058
03992	Corrosion preventive compound	6	8030	12977347
04057	Battery, nonrechargeable	21	6135	503280
04240	Antiseize compound	8	8030	5015084
04293	Battery assembly	21	6135	1683721
04294	Battery, nonrechargeable	21	6135	1683722
04295	Battery, nonrechargeable	21	6135	1683723
04328	Antiseize compound	6	8030	2003782
04335	Packing material	16	5330	1909978
04451	Cleaning compound, solvent	15	7930	13425317
04465	Battery, storage	21	6140	2555719
04623	Battery, storage	21	6140	3509564
04717	Battery, storage	21	6140	4014956
04804	Calibration gas	5	6830	4607704
04958	Catalyst, carbon monoxide	18	6850	14450557
05010	Battery, nonrechargeable	21	6135	6433485
05071	Activator, photograph	13	6750	6081092
05136	Cartridge, oxygen removal	18	4610	7760688
05275	Potassium hydroxide solution	3	6810	8507787
05338	Bonding kit	2	5330	8827073
05346	Cleaner, recorder head	4	5835	8853818
05537	Battery, nonrechargeable	21	6135	9735632
05611	Lubrication kit, photographic	13	9150	10143512
05614	Battery, storage	21	6140	10152861
05643	Cartridge, chemical	5	4610	10229970
05671	Ion exchange compound	17	6810	10294217
05671	Ion exchange compound	17	6810	10294217
05826	Hydraulic fluid, automatic transmission	9	9150	10929755
05826	Hydraulic fluid, automatic transmission	9	9150	8431636
05827	Battery, nonrechargeable	21	6135	10937426
05919	Desiccant replacement	17	6605	11442000
05937	Battery, storage	21	6140	11546935
06034	Desiccant, activated	17	6850	12622989
06169	Desiccant, activated	17	6850	12258015
06337	Asbestos sheet, compressed	16	5330	1716030
06500	Desiccant, activated	17	6850	8518725
06605	Battery, nonrechargeable	21	6135	9268322
06629	Battery assembly	21	6135	12308106
06652	Packing material	16	5330	1718766
06852	Asbestos sheet, compressed	16	5330	13840675
06884	Electrolyte	1	6810	11492805
07001	Desiccant, activated	17	6850	6896438
07478	Battery assembly	21	6140	13157887
07479	Battery assembly	21	6135	13157888

SPIN	NAME	GROUP #	FSC	NIIN
07640	Battery, storage	21	6140	11179646
07965	Desiccant, activated	17	6850	11126490
08186	Battery assembly	21	6135	12921071
08247	Battery, nonrechargeable	21	6135	12633611
08365	Battery, storage	21	6140	1110500
08366	Battery, storage	21	6140	1110508
08367	Battery, storage	21	6140	1110512
08368	Battery, storage	21	6140	1110520
08387	Battery, ncg	21	6140	11518255
08388	Battery assembly	21	6140	11923063
08593	Battery, nonrechargeable	21	6135	13401983
08624	Battery, storage	21	6140	1852071
08697	Battery, storage	21	6140	5026262
08698	Battery, storage	21	6140	10601983
08699	Battery, storage	21	6140	11817186
08808	Battery, storage	21	6140	3930914
08988	Inhibitor, corrosion, water soluble	6	6850	13629256
08989	Desiccant, activated	17	6850	13629257
09026	Battery, nonrechargeable	21	6135	14821290
09093	Lubricating oil, aircraft piston	11	9150	2359059
09094	Lubricating oil, exposed gear	11	9150	13987341
09099	Lubricating oil	11	9150	14108972
09110	Dry cleaning solvent	15	6850	1104498
09110	Dry cleaning solvent	15	6850	2745421
09110	Dry cleaning solvent	15	6850	6376135
09122	Inhibitor, corrosion, vapor barrier	6	6850	13381392
09123	Inhibitor, corrosion, vapor barrier	6	6850	14089025
09124	Inhibitor, corrosion, vapor barrier	6	6850	14062060
09126	Citric acid reagent	17	6810	13620042
09129	Adhesive	2	8040	10340401
09137	Sealing compound	2	8030	637176
09138	Enamel	12	8010	5985929
09145	Corrosion resistant coating	6	8030	7794699
09154	Desiccant, activated	17	6850	6802234
09157	Enamel	12	8010	13445321
09174	Adhesive	2	8040	2708136
09182	Inhibitor, corrosion	17	6850	12871057
09189	Enamel	12	8010	13562938
09198	Cleaning compound, solvent	15	7930	13425316
09202	Corrosion removing compound	6	6850	13609650
09214	Adhesive	2	8040	11211439
09220	Lubrication oil, engine	11	9150	11524118
09221	Lubrication oil, engine	11	9150	11524119
09234	Inhibitor, corrosion	6	6850	14139361
09242	Battery assembly	21	6140	14685954

SPIN	NAME	GROUP #	FSC	NIIN
09246	Leak test compound	7	6850	13960159
09248	Leak test compound	7	6850	13960163
09259	Grease lubrication	8	9150	11781221
09394	Polyurethane coating	12	8010	14133633
09398	Calibration viscosity oil	11	6850	14701231
09405	Calibration oil	11	6850	14701224
09406	Calibration oil	11		LLH444505
09428	Brake fluid, automotive	9	9150	11029455
09429	Fluid, coolant	11	9160	13040885
09448	Hydraulic fluid, arresting gear	9	9150	2248729
09453	Cleaning compound, solvent	15	6850	13110192
09462	Preservative coating, rubber	12	8030	13142213
09475	Adhesive	2	8040	8326173
09478	Epoxy coating kit	12	8010	14191145
09500	Bearing dye, blue	10	6850	3116172
09503	Grease, special purpose	8	9150	10696857
09504	Lubricating oil, gear	11	9150	13446628
09505	Lubricating oil, air compressor	11	9150	10997155
09508	Grease, aircraft	8	9150	7219490
09509	Lubricant, chain and cable spray	11	9150	11932020
09512	Lubrication oil, refrigerant compressor	11	9150	14351899
09523	Lubricating oil, hydraulic	11	9150	10719915
09524	Cleaning compound, solvent	15	6850	13804369
09524	Cleaning compound, solvent	15	6850	13840618
09525	Cleaning compound, aircraft surface	4	6850	13907828
09528	Citric acid, anhydrous, technical	1	6810	1412942
09531	Sodium bicarbonate, anhydrous, technical	3	6810	2411099
09535	Topcoat	12	8010	14379662
09536	Primer coating	12	8010	14391311
09546	Lubricating oil, pneumatic tool	11	9150	11802295
09559	Electrolyte, 44% to 46% KOH	3		
09565	Corrosion preventive compound	6	8030	13871070
09567	Corrosion preventive compound	6	8030	13863871
09572	Hydrogen peroxide, topical solution	18	6506	1538480
09583	Grease, ball and roller bearing	8	9150	11235103
09587	Lubrication oil, refrigerant compressor	11		
09588	Lubrication oil, refrigerant compressor	11		
09600	Battery assembly	21	6135	12294940
09642	Battery, storage 12V	21	6140	13657743
09643	Cleaner, recorder head	1	5835	14242782
09644	Cleaner kit, disk	1	7045	13167523
09648	Battery, nonrechargeable	21	6135	12682151
09649	Calibrating gas mixture	5	6830	14458231
09650	Grease, aircraft	8	9150	9448953
09699	Polish, photoreceptor	14	6850	10988745

SPIN	NAME	GROUP #	FSC	NIIN
09746	Battery, nonrechargeable	21	6135	12146441
09747	Antiseize compound	11	99	LLH839577
09748	Water displacing compound	15	6850	1429409
09752	Adhesive	2	8040	13317469
09754	Penetrating oil	11	9150	9051387
09755	Lubricating oil, engine	11	9150	1912772
09758	Sealing compound	2	8030	11045392
09764	Corrosion preventive compound	6	8030	14189006
09764	Corrosion preventive compound	6	8030	14189005
09764	Corrosion preventive compound	6	8030	14189007
09764	Corrosion preventive compound	6	8030	14189008
09779	Corrosion preventive	6		
09784	Antifreeze	15	6850	14553116
09794	Lubricant, fluoro-si	11	9150	2481734
09795	Sealing compound	2	8030	641075
09803	Grease, ball and roller bearing	8	9150	3470471
09804	Lubricating, oil	11	7150	13519017
09805	Battery, nonrechargeable	21	6135	14475082
09806	Battery, nonrechargeable	21		8264798
09820	Corrosion preventive, compound	6	8030	14504009
09821	Battery, storage	21		4316805
09824	Grease	8		00N031804
09828	Corrosion preventive compound	6		13817311
09832	Glass cleaner	15		10533758
09834	Detergent	7		
09843	Cleaner, membrane	3	6850	14469518
09844	Cleaner, membrane	3		14469489
09855	Sealing compound	2	8030	11376964
09868	Cleaning compound, solvent	15	6850	11736391
09869	Tetrachloroethylene, technical	15	6810	10132541
09870	Corrosion preventive compound	6	8030	13351401
09871	Hydraulic fluid, power steering	9	9150	10872234
09873	Sealing compound	2	8030	13138827
09876	Cleaning compound, concentrate	4		
09877	Cleaning compound, concentrate	4		
09878	Cleaning compound, concentrate	4		
09880	Cleaning kit, thermal head	15	7045	14080016
09882	Battery assembly	21	6140	13842414
09888	Cleaner, carburator & choke	15		
09889	Lubricant, starter pinion	11		
09890	Additive, fuel	15		
09891	Lubricant, gearcase	11		
09892	Conditioner, fuel	15		
09907	Lubricating oil, refrigerant	11	9150	14439390
09908	Lubricating oil, refrigerant	11	9150	14439396

SPIN	NAME	GROUP #	FSC	NIIN
09909	Grease, automotive	8	9150	11977693
09913	Battery, nonrechargeable	21	6135	14288821
09924	Anti-seize compound	8	8030	5015084
09925	Battery, storage	21	6140	4496001
09926	Zinc oxide paste, USP	11	6505	1502500
09932	Anti-galling compound	6	9150	14462164
09937	Cutting fluid, lapping operations	11	9150	12614688
10005	Cleaner, solvent	15		
10016	Battery, storage	21	6140	14562987
10034	Corrosion preventive compound	6	8030	14384064
10051	Enamel (haze gray)	12	8010	14416450
10052	Enamel (haze gray)	12	8010	14416451
10060	Water sampling test reagent	17	6630	13575910
10061	Water sampling test reagent	17	6630	13628299
10063	Sodium thiosulfate (crystals)	17	6810	2348380
10068	Sodium hydroxide	3	6810	2010909
10069	Magnesium chloride	17	6810	2270411
10070	Potassium dihydrogen phosphate	17	6810	2921121
10072	Comparator, color (chlorine & ph test)	17		
10073	Paint, navy gray	12		
10074	Paint primer, light gray quick dry	12		
10075	Paint thinner	12		
10094	Cartridge, oxygen removal	18	4610	14440242
10095	Filter element, fluid	11	4330	14567159
10103	Fluid, transmission	9		
10104	Lubricating oil, gear	11	9150	14204478
10105	Battery, storage	21	6140	13896178
10106	Battery, storage	21	6140	14576156
10107	Battery, storage	21	6140	14643896
10109	Module chgr assy battery	21	6130	14718418
10111	Sealing compound	2	8030	2472525
10112	Sealing compound	2	8030	11840328
10113	Paint, enamel	12	8010	14621370
10122	Lubricating oil, air compressor	11	9150	13332517
10183	Vapor capsules, corrosion inhibiting	6	4440	14813150
10191	Scale removing compound	1	6850	14578789
10204	Lubricating oil, instrument	11	9150	12615921
10223	Cleaner, ultrasonic	4		
10230	Germicidal solution	7	6505	11562170
10250	Lubricant	11	1386	12782163
10258	Sealing compound	2	8030	12863924
10272	Cleaner, ultrasonic	4	4940	6091554
10275	Filter element, fluid	11	4330	12570870
10279	Battery	21	0	LLCYA6383
10324	Grease, aircraft and instrument	8	9150	14419016

SPIN	NAME	GROUP #	FSC	NIIN
10332	Battery, nonrechargeable	21	6135	13336101
10333	Battery, nonrechargeable	21	6135	13018776
10334	Battery, storage	21	6140	14904317
10349	Gen-Zyme, drain cleaner	3		
10355	Hydraulic fluid, fire resistant	9	9150	11039411
10407	Battery, storage	21	6140	14594084
10472	Grease, Mobil NLGI #2 lithium base	8		
10481	Remover, paint	15	8010	14344696
10482	Paint, enamel, red	12	8010	14621369
10483	Paint, enamel, haze gray	12	8010	14713275
10484	Paint, enamel, yellow	12	8010	14621364
10485	Paint, enamel, black	12	8010	13445114
10486	Cleaning compound, solvent-detergent	15	7930	13300187
10487	Sealing Compound	2	8030	14437388
10519	Nitrogen, liquid	5		
10526	Amazing cleaner	15		
10560	Detergent, general purpose	7	7930	11291128
10561	Corrosion, preventive	6	6850	13283617
10681	Greases	8		
10713	Quick clean degreaser	4		
10732	Bateery, nonrechargeable	21	6135	14992112
10766	Desiccant, activated	17	6850	9359794
10778	Corrosion Preventive Compound	6	8030	1180666
10788	Chlorine, test reagent	17	6550	14568981
10807	N-Dodecane	19	6810	14192677
10815	Corrosion preventive compound	6	8030	14846227
10816	Lubricating oil, weapons	11	9150	11045227
10817	Grease, plug valve	8	9150	2618294
10817	Grease, plug valve	8	9150	2618295
10828	Anti-foam, compound, silicone	11	6850	9268885
10833	Epoxy Coating Kit	12	8010	13027058
10846	Epoxy, coating kit	12	8010	13504743
10851	Epoxy coating kit	12	8010	12186560
10852	Soda lime, reagent	3	6810	11130110
10880	Soap, ivory	7	8520	11338099
10886	Sealing compound	2	8030	10249584
10892	Sealing compound	2	8030	14944135
10894	Cell, battery	21	6135	14615322
10895	Battery, storage	21	6140	14714877
10896	Cleaning compound, solvent	15	6850	13780044
10898	Battery, nonrechargeable	21	6135	14659477
10909	Enamel	12	8010	13505239
10910	Enamel	12	8010	13966805
10920	Battery, storage	21	6140	14863228
10922	Hydraulic fluid, petroleum base	9	9150	14412863

SPIN	NAME	GROUP #	FSC	NIIN
10923	Cleaning compound, solvent-detergent	4	7930	14181151
10923	Cleaning compound, solvent-detergent	4	7930	14181152
10923	Cleaning compound, solvent-detergent	4	7930	14181153
10923	Cleaning compound, solvent-detergent	4	7930	14181155
10929	ReAct kit structural acrylic	2	8040	14991663
10930	Ampoule, dissolved oxygen	3	6850	13604736
10941	Sealing compound	2	8030	10145869
10951	Enamel, red	12	8010	13499006
10951	Enamel, red	12	8010	13966798
10951	Enamel, red	12	8010	13499006
10959	Picture pack, rapid processing, photo	13	6135	12511430
10960	Battery, nonrechargeable	21	6135	1281632
10978	Propylene glycol, technical	15	6810	11817121
11023	Sealant, tough guard	14	99	LLH563629
11034	Cleaning solution, optical	4	6850	11967568
11042	Battery, storage	21	6140	14213189
11044	Corrosion preventive compound	6	8030	10151550
11045	Sealing compound	2	8030	14457580
11052	Lubricating oil, refrigerant	11	9150	15023689
11060	Oxygen, aviator breathing	5	6830	11694836
11074	Hardener, sealing compound	2	8030	11036405
11075	Lubricating oil, refrigerant	11	9150	15028462
11076	Grease, general purpose	8	9150	10864163
11116	Adhesive	2	8040	1450019
11117	Sealing, compound	2	8030	13336730
11121	Lubricating oil, gear	11	9150	14140615
11122	Sealing compound	2	8030	10139306
11123	Adhesive	2	8040	7856706
11126	Primer, sealing compound	2	8030	13885604
11127	Sealing compound	2	8030	11423131
11130	Adhesive	2		
11149	Filter cleaning kit	11	2815	14542017
11151	Emulsan brand polysaccharide bio-polymer	4		
11194	Propane cartridge	5	6830	13208823
11195	Scale removing compound	1	6850	9491397
11199	Adhesive	2	8040	12503969
11211	Alcohol, denatured	15	6810	2056786
11214	Hydraulic oil	9	9150	11692789
11217	Oxygen, aviator's breathing	5	6830	7822639
11219	Germicidal solution (Sanzide Plus)	7		
11220	Germicidal solution (Confidence Plus)	7		
11221	Hydraulic oil	9		
11222	All-purpose spray adhesive	2		
11224	Germicidal solution (Bi-Arrest 2)	7		
11225	Germicidal solution (Advance TBE)	7		

SPIN	NAME	GROUP #	FSC	NIIN
11266	Soda lime, reagent	3	6810	13585122
11294	Gasket	16	5330	13517008
11318	Sealing compound	2	8030	10668156
11329	Grease, general purpose	8	9150	13529706
11349	Additive, coolant	15	6850	14767761
11413	Battery, nonrechargeable	21	6135	14557946
11421	Vapor capsules, corrosion inhibited	6	4440	14759949
11435	Sealing compound	2	8030	812336
11440	Oil, Royco 757	11		
11445	Battery, storage	21	6190	13583027
11446	Battery, storage	21	6140	13710519
11447	Battery, nonrechargeable	21	6135	14434484
11484	Battery, nonrechargeable	21	6135	14148831
11485	Battery, nonrechargeable	21	6135	13204815
11511	Chemical pills, repl	17	4220	14709908

APPENDIX D

BIBLIOGRAPHY

Key, Marcus M., et al, Occupational Diseases - A Guide to Their Recognition, U.S. Department of Health, Education, and Welfare, NIOSH Publication No. 77-181, Washington, D.C., 05/01/1998.

Mackison, Frank W. et al, NIOSH Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, NIOSH Publication No. 2001-145, Washington, D.C., 2001.

Naval Ships' Technical Manuals:

Chapter No.	Title/Volume	Publication No.
220	Boiler Water/Feed Water Chemistry	S9086-GX-STM-022
220	Boiler Water/Feed Water Chemistry, Vol. II	S9086-GX-STM-020
220	Corrosion and Contamination Control for Diesel Engine Cooling Water System, Vol. III	S9086-GX-STM-030
221	Boilers	S9086-GY-STM-010
223	Submarine Storage Batteries Lead-Acid Batteries	S9086-AB-ROM-010
262	Lubricating Oils, Greases, Hydraulic Fluid and Lubrication System	S9086-H7-STM-000
300	Electrical Plant - General	S9086-KC-STM-010
313	Portable Storage and Dry Batteries	S9086-KR-STM-010
532	Liquid Cooling Systems for Electronic Equipment	S9086-SD-STM-010
550	Industrial Gases Generating, Handling, and Storage	S9086-SX-STM-010
555	Shipboard Firefighting	S9086-S3-STM-010
556	Hydraulic Equipment Power Transmission and Control	S9086-S4-STM-010
593	Pollution Control	S9086-T8-STM-000
635	Thermal Insulation	S9086-VH-STM-00F
670	Stowage, Handling, and Disposal of Hazardous General Use Consumables	S9086-WK-STM-010
9150	Gasoline and JP-5 Fuel System	0901-LP-150-0003

NAVSEAINST 5100.3D, Mercury, Mercury Compounds, and Components

Containing Mercury or Mercury Compounds; Control of

OPNAVINST 5090.1B - Environmental and Natural Resources Program Manual.

OPNAVINST 5100.19D - NAVOSH Program Manual for Forces Afloat, Volumes 1 through III, Chapters B3, C23 and D15.

OPNAVINST 5100.23F - NAVOSH Program Manual, Chapter 7.

BUMEDINST 6270.8A - Procedures For Obtaining Health Hazard Assessments

Sax, Irving and Richard Lewis, Dangerous Properties of Industrial Materials, 7th ed., Volumes I, II, and III, Van Nostrand Reinhold, New York, 1984.

Ships Hazardous Material List, Naval Inventory Control Point, Mechanicsburg, PA. [Available online at the Naval Logistics Library http://nll1.navsup.navy.mil/shml/shmlmain.cfm]

Standard PMS Materials Identification Guide (SPMIG), S9081-AE-GYD-010/ SPIN 0910-LP-265-2400, Naval Sea Systems Command, Washington, D.C., 1989. Available on line at https://ftsc.navy.mil/pmsdb/spmig_web.cfm

U.S. Department of Transportation, 1993 Emergency Response Guidebook, Publication No. DOT P 5800.6, Washington, D.C., 1993.

NOTE: Many HM references and links are available on the Naval Safety Center's web site at www.safetycenter.navy.mil.

APPENDIX E
GLOSSARY OF TERMS

Acid - Any corrosive having a pH less than 7.

Acid Locker - A locker specifically designed and authorized for storing HM with a pH less than 7. Normally the interior and/or shelving is of corrosion resistant material such as lead, rubber, or polyethylene plastic. If the acid is also classified as a flammable acid, the locker must be located in the flammable liquid storeroom in accordance with NSTM 670 and OPNAVINST 5100.19D.

Acute - Severe, usually crucial, often dangerous in which rapid changes are occurring. An acute exposure runs a comparatively short course.

Aerosol - Any material dispensed from a pressurized container using a gas propellant.

Atmosphere Immediately Dangerous to Life or Health (IDLH) - The concentration of a contaminant which can produce an immediate irreversible debilitating effect on health, or which can cause death.

Asbestos - A fibrous mineral, which can be produced into a material that is fireproof and possesses high tensile strength, good heat and electrical insulating capabilities, and moderate to good chemical resistance.

Base - Any corrosive, caustic or alkali having a pH greater than 7.

Bound Asbestos - Asbestos which is tightly compacted and is not normally a health hazard unless worked by punching, grinding, machining or sanding or when the material is deteriorated.

Canister, Oxygen-Generating - A container filled with a chemical which generates oxygen by chemical reaction.

Cartridge, Air-Purifying - A container with a filter, sorbent, or catalyst, or any combination of these which removes specific contaminants from the air drawn through it.

Caustic - Any corrosive having a pH greater than 7.

Chemical Agent - A chemical compound intended for use in military operations to kill, seriously injure, or incapacitate people through its chemical properties. Excluded are riot control agents, chemical herbicides, pesticides, and industrial chemicals unrelated to chemical warfare.

Chronic - Persistent, prolonged, repeated.

Combustible Liquid - A liquid having a flash point at or above 100^{o}F.

Compressed Gas - Material, which may or may not be HM in itself, which is stored in pressurized containers.

Corrosive Material - Any HM that will cause severe tissue damage by chemical action or materially damage surfaces or cause a fire when in contact with organic material or certain other chemicals.

Dust - Small solid particles created by the breaking up of larger particles by processes such as crushing, grinding, or explosion.

Examples of processes that generate dust: use of machine shop tools, paint chipping, sanding, woodworking, abrasive blasting.

EEBD (Emergency Escape Breathing Device) - A respirator that provides the user with oxygen through a chemical reaction. Only to be used in emergency escape procedures.

Explosion - The unintentional or inadvertent initiation, detonation, deflagration, reaction, or burning of ordnance material possibly resulting in damage, death, or injury.

Explosive Material - A chemical, or a mixture of chemicals, which undergoes a rapid chemical change (with or without an outside supply of oxygen) liberating large quantities of energy in the form of blast, light, or hot gases. Incendiary materials and certain fuels and oxidizers which can be made to undergo a similar chemical change are also explosive materials. Examples of explosive materials include:

a. Explosives. TNT, PBXN, PETN, PBXC, RDX, compositions, Explosive D, tetryl, fulminate of mercury, black powder, smokeless powder, flashless powder, and rocket and missile propellants.

b. Fuels and Oxidizers. OTTO fuel, mixed amine fuel, inhibited red fuming nitric acid, and ethylene oxide.

c. Incendiaries. Napalm, magnesium, thermite, and pyrotechnics.
. Any unintentional or uncontrolled release of a chemical agent.

d. Leaking or spilled propellant fuels and oxidizers (less OTTO II fuel).

e. Ordnance impacting off-range.

Flammable Liquid - A liquid with a flash point below 100^{o}F and having a vapor pressure not exceeding 40 lbs./square inch.

Flammable Liquids Cabinet - A cabinet specifically designed and authorized for storing flammable in-use material.

Flammable Liquids Storeroom - A space specifically designed and authorized for storing flammable liquids.

Flashpoint - The minimum (lowest) temperature at which the vapors given off from a material will support combustion provided an ignition source.

Friable Asbestos - Loosely bound asbestos whose fibers may easily crumble or pulverize. A health hazard because it easily releases contaminants into the air.

Fume - Very small particles (1 micrometer or less) formed by the condensation of volatilized solids, usually metals.
Examples of processes that generate fumes: zinc socket pouring, smelting, furnace work, foundry operations, and welding.

Gas - A material that under normal conditions of temperatures and pressure (20 degrees Celsius and 760mmHg, respectively) tends to occupy an enclosed space uniformly.

Hazardous Material (HM) - Any material that because of its quantity, concentration, or physical or chemical characteristics may pose a substantial hazard to human health or the environment when purposefully released or accidentally spilled. This definition includes the following:

- Aerosol Containers
- Flammable Materials
- Toxic Materials
- Corrosive Materials (including acids)
- Oxidizing Materials
- Compressed Gases

For this manual the definition does not include ammunition, weapons, explosives, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical wastes, infectious materials, bulk fuels, and radioactive materials.

Hazardous Material Control and Management (HMC&M) Hazardous Material Information System (HMIS) - A computer-based information system distributed Navy-wide on compact disk - read only memory (CD-ROM) which provides right-to-know information found in the MSDS written by the manufacturer for HM used throughout the DoD.

Hazardous Material Information Resource System (HMIRS) – An Internet web-based version of the Hazardous Material Information System available at http://www.dlis.dla.mil/hmirs .

Hazardous Waste - Any discarded material (liquid, solid or gas) which meets the above definition of HM and/or is designated as a hazardous waste by the Environmental Protection Agency or a State HM control authority.

Illness - Any abnormal condition or disorder, other than one resulting from an injury, caused by exposure to conditions associated with the occupational environment.

Incompatible HM/HW - Materials that react with each other to produce undesirable products. Mixing incompatible HM can produce heat, or pressure, fire, or explosion, or toxic or irritating effects, or flammable dusts, mists, fumes, or gases.

In-Use Material (IUM) - The minimum quantity of HM required to be ready for a 1-week's use by Maintenance Requirement Cards (MRCs) Job Process, etc.

Man-made Vitreous Fibers (MMVF) - are a group of fibrous inorganic materials, generally aluminum or calcium silicates, that are derived from rock, clay, slag, and glass and used for thermal and acoustical insulation and as reinforcement materials.

Maintenance Requirement Card (MRC) - provides the maintenance planner and worker all of the information they need to plan, schedule, and perform a maintenance action.

Material Safety Data Sheet (MSDS) - Written or printed data concerning a HM prepared by the manufacturer of the HM in accordance with paragraph (g) of 29 CFR 1910.1200 - Hazard Communication.

Mist and Fog - Finely divided liquid droplets suspended in air and generated by condensation or atomization. A fog is a mist of sufficient concentration to obscure vision. Examples of materials and processes that produce mists: acid sprays used in metal treatment (e.g., electroplating) organic solvent sprays, and spray painting).

MSHA - Mine Safety and Health Administration.

NIOSH - National Institute of Occupational Safety and Health.

NIOSH/MSHA-Certified Equipment - Respirators or other equipment that have been tested by NIOSH or MSHA and jointly approved as meeting certain minimum requirements of protection against specified hazards.

OSHA - Occupational Safety and Health Administration, Department of Labor.

OSHAct - The Williams-Steiger Occupational Safety and Health Act of 1970 (Stat. 1590 et seq., 29 U.S.C. 651 et seq.).

OSHA Standards - OSHA standards are those standards issued by the Department of Labor's Occupational Safety and Health Administration under Section 6 of the OSHAct.

Oxidizers - Any material that readily yields oxygen to support combustion.

Oxygen Breathing Apparatus (OBA) - Respirator that provides the user with oxygen through a chemical reaction. OBA's are for emergency or damage control use only.

Oxygen Deficient Atmosphere - Atmosphere with insufficient oxygen (O_2) to support life. This deficiency is generally caused by oxidation, dilution, or by the displacement of oxygen by other gases.

Examples: Oxidation can consume O_2 either very quickly as in a fire or quite slowly as rusting in a confined space. Dilution/displacement of O_2 may occur in one of three ways: (a) deliberately, as in suppressing a fire using carbon dioxide (CO_2) or a halocarbon; (b) deliberately, as in inerting to prevent rusting or for inerting prior to hot work, using nitrogen (N_2) or another inert gas; or (c) accidentally, as when a halocarbon solvent, such as "Freon"-113, is spilled and vaporizes in a confined space.

Particulate Matter - Any fine solid or liquid particles such as dust, fog, fumes, mist, smoke or spray. Particulate matter suspended in air is commonly known as an aerosol.

Permissible Exposure Limit (PEL) - The legally established time-weighted average (TWA) concentration or ceiling concentration of a contaminant or exposure level of a harmful physical agent that shall not be exceeded.

Personal Protective Equipment (PPE) - A device or item to be worn, used, or put in place for the safety or protection of an individual or the public at large, when performing work assignments or in entering hazardous areas or under hazardous conditions. Equipment includes hearing protection, respirators, electrical matting, barricades, traffic cones, lights, safety lines, and life jackets.

Pesticide - Any chemical used to kill pests, such as insects.

Examples: Baygon (propoxur), Killmaster (dursban), d-phenothrin, Malathion.

pH – A number specifying the acidity or alkalinity of a solution.

Protective Clothing - An article of clothing furnished to an employee at government expense and worn for personal safety and protection in the performance of work assignments in potentially hazardous areas or under hazardous conditions.

Respirator - Device used for protecting the respiratory tract from harmful contaminants.

SEED - Supplemental Emergency Escape Device. An emergency self-contained air supply for main propulsion watchstanders.

Self-Contained Breathing Apparatus (SCBA) - Breathing apparatus where compressed air is carried in a tank on the user's back.

Ship's HM List (SHML) - A list of HM authorized for use aboard surface ships. This list can be found in the HMC&M HMIS on CD-ROM.

Smoke - Carbon or soot particles less than 0.1 micrometer in size resulting from the incomplete combustion of carbonaceous materials such as coal or oil.

Solvent - A substance, most commonly water, but often an organic compound which is used to dissolve another substance.

Submarine Material Control List (SMCL) - A list of HM authorized for use aboard submarines. This list is issued quarterly on CD-ROM.

Substitution - The risk of injury or illness may be reduced by replacement of an existing process, material, or equipment with a similar item having a lower hazard potential.

Threshold Limit Value (TLV) - An atmospheric exposure level under which nearly all workers can work without harmful effects. TLVs are established by the American Conference of Governmental Industrial Hygienists (ACGIH).

Time-Weighted Average (TWA) - The average concentration of a contaminant in air during a specific period of time, usually an 8-hour work day or a 40-hour work week.

Toxic Material - A substance which when ingested, inhaled, or absorbed through the skin in sufficient amounts can produce harmful effects such as changes in living tissue, impairment of the central nervous system, severe illness or, in extreme cases, death.

Vapor (inorganic or organic) - The gaseous state of a substance which is normally a liquid or solid at room temperature.

Examples of substances that produce vapors: degreasers, fuels, hydraulic fluids, paints and thinners, and dry cleaning fluids. Mercury is one metal that can vaporize at room temperatures.

Ventilation - The control of potentially hazardous airborne substances through the movement of air.